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The Effects of Image-Schema on Learning and Retention of English Prepositions by Intermediate Kurdish EFL Learners

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ABSTRACT

Although a small proportion of the English language is taken by prepositions, they play an important function. Foreign language learners fail to learn them and show difficulties in using propositions correctly. This quantitative study aimed to examine the effectiveness of the Image schema method in helping intermediate Kurdish students in learning ten English prepositions including in, on, at, to, behind, in front of, between, beside, over, and under. 100 intermediate EFL Kurdish learners within the age range of 18 to 20 from Lebanese French University in Kurdistan, Iraq were the participants of the present study. An Oxford Placement Test (OPT) was administered to have relatively two homogenous groups regarding their language proficiency. Based on the results, the students whose scores were +_1 standard deviation above or below the mean score were selected as the members of the two groups namely, one experimental and one control group (50 in each group). To assess the participants' learning and retention before and after the intervention, a pretest and a posttest were employed. The findings of statistical analysis revealed that the Image schema method had a greater impact on English preposition learning in comparison with rote learning. Thus, the present study has some pedagogical implications for English language instructors in Iraq to be aware of cognitive linguistic usage as a frequent practice in the EFL classroom.

KEYWORDS: Cognitive Linguistics; English Prepositions; Image Schema; Kurdish Learners

INTRODUCTION

Prepositions in English, such as in, on, at, to, behind, in front of, between, beside, over, and under, etc. are linguistic elements that are difficult for English language learners to grasp and are thus acquired much later (Aajami, 2022). This is due to their language-specific qualities, which means they may not always have perfect analogs in other languages (Jarvis & Pavlenko, 2008). Even proficient L2 speakers cannot achieve native-like use of this linguistic feature, especially when the speakers' L1 differs significantly from the L2 in terms of how the language conceptualizes spatial relationships (Alonso et al., 2016).

The different uses that the same preposition codes for are likely coincidences. However, a growing body of research has shown that prepositions, like other polysemous words, form radial networks with the geographical senses at their center and the more metaphorical temporal and abstract senses radiating out towards the periphery (Bouabida, 2020; Cho, 2010). Because there is no one-to-one correlation between Kurdish and English prepositions, learners face difficulties since one Kurdish preposition equals four English prepositions; for example, la in Kurdish equals at, in, on, and from in English. Prepositions are more complicated than they appear because they alter the syntactic and semantic functions of words (Ming, 2011).

Due to the crosslinguistic distinctions between Kurdish and English, L2 Kurdish learners find it difficult to learn English prepositions. This assertion is supported by the fact that the primary cause of Kurdish learners' errors while using English prepositions is negative transfer from the L1.The instruction of English prepositions is primarily based on verbal explanations along with picture descriptions. Meanwhile, recent studies show that the majority of EFL learners have difficulties in preposition use (Badamdari et al., 2022; Hung, 2017). As a result, developing effective methods for teaching prepositions is necessary. Ticio and Avram (2015) argue that it is proved by the existing literature that semantic features should be taken into account while learning additional language. There is a great agreement on the fact that there are ties between memory and language production in adult language learning so some cognitive processes are required in using another language (Kroll et al., 2015; Skrzypek & Singleton, 2013). The introduction of cognitive linguistics (CL) has some implications for the instruction of English prepositions because it is based on human language and mind relationships. It emphasizes the fact that the instruction of English prepositions should be meaning-based and employ image schemas (Boers, 2011).

While other schools of linguistics focused on the language output, CL examined how the output is produced. Cognitive linguists think that physical relations between objects are first experienced by human beings and then these spatial relations are expressed in their language coding called spatial meaning (Song et al., 2015). So investigating how the adapted image schema methods can affect preposition teaching and whether relying on theory in language learning is worthwhile were the ultimate object of the present study. The research focused on the prepositions in, on, at, to, behind, in front of, between, beside, over, and under, which have extremely different meanings, are commonly used in both spatial and non-spatial contexts, and are used in school textbooks in the form of contextual translations that are suitable for memorization-based learning (Murphy, 2013). Some prepositions like in, at, to, and on have similar meanings that can be categorized as within a particular area (OALD, 2005), indicating their basic sense of location in space. As a result, pupils may find it difficult to use precise prepositions to represent a specific spatial place. For example, all viable expressions include in the back, at the back, and on the back. These prepositions, on the other hand, have their own distinct meanings, as evidenced by the Oxford Advanced Learner's dictionary's illustration of eighteen separate usages of in, fifteen of at, and eighteen of on. In conclusion, the analysis of earlier studies calls for more studies into the use of image schema education for learning English prepositions to empirically evaluate if this strategy may be more successful than rote learning in a Kurdish EFL teaching setting.

REVIEW OF THE RELATED LITERATURE
THEORETICAL BACKGROUND TO THE STUDY

According to Cooper (2009), theories concerning human learning can be broadly divided into four categories: behavioristic theories, which emphasize visible behavior; cognitive theories, which see learning as solely a neurological or mental process; humanistic theories, which emphasize affect and emotions in learning; and social perspectives, which believe that learning occurs best in groups. Three different educational theories including constructivism, information processing and computer models, and gestalt learning theory are all connected to the cognitive perspectives. Constructivism is of considerable importance to the current study since it is founded on progressive education principles and addresses the meanings and realities that learners possess and employ as they go through a range of cognitive processes (Currie, 2008). Cooper (2009) states that learning involves actively processing and making connections between the learner's past experiences and information to form conceptual meanings.

When studying how people learn English prepositions, the important use of Ausubel's subsumption theory (2000) is considered. This theory suggests that new knowledge should be integrated into a person's existing cognitive structures, and it is seen as a crucial aspect of the constructivist approach. Asubel (2000) states that rote learning and meaningful learning are two types of learning. Though the purposes and efficacy of rote learning and meaningful learning are different, both teaching strategies may aid students' learning. Ausubel (1968) described rote learning as simple memorization: memorizing isolated items that can be arbitrarily linked to cognitive structures. So, learners fail to create a cognitive structure because they do not attempt to integrate new material with related previous ones in the cognitive structures (Novak & Cañas, 2006). Cognitive structures are the fundamental mental processes that humans utilize to interpret information. They are crucial to logical reasoning, symbolic representation, and comparison thinking. Generally speaking, rote learning relies more on repetition than it does on mentally storing information that is connected to preexisting cognitive structures. Teachers may occasionally respond, "That's the way it is," when asked about English prepositions, saying that some prepositions must be "simply learned by heart." To put it briefly, learners

who are learning by rote do so by simple memorization and do not attempt to integrate newly learned material with previously acquired information that is stored in cognitive structures. In addition to making students disinterested, this process teaches them only rigid, somehow isolated items instead of flexible structures within a related cognitive system (Ausubel, 1968). Conversely, Cooper (2009) states that meaningful learning happens by creating representational equivalencies between mental context and language signs. To engage in meaningful learning, students must both refine and contribute new information to the cognitive structure by looking for ways to connect new ideas with relevant ideas or concepts in the cognitive structures (Novak & Cañas, 2006). To put it differently, applying one's previous knowledge to a new context by forming a mental model is the process of acquiring information through meaningful learning (Mayer & Moreno, 2003).

In general, a meaningful learning process includes choosing the material, arranging it, drawing on relevant past knowledge, and creating coherence by combining data from several sources. According to Jonassen and Land (2002), this process makes the learners able to present their reasoning concretely and to see and check the results of their thinking which is in line with the principles of constructivist thinking. Grammar instruction has long been a major problem, and many strategies and tactics have been put out for both teaching grammar in particular and teaching English to speakers of other languages in general (Cho, 2010). Although several cognitive linguistics-inspired teaching strategies have previously been created, their use in classroom settings is still relatively new and uncommon (Hwang, 2023). Teaching prepositions in an explanatory, semantically-based way promotes deeper learning, more learner confidence, and longer retention rates, according to Hung et al. (2018). The notion of picture schemas, one of the main tenets of cognitive linguistics (CL) and semantics has gained significant attraction in related fields like cognitive and developmental psychology.

The concept of an image schema was first introduced through the embodied cognition theory, which was put out by several of the pioneers in cognitive semantics. As one of the cognitive models and a crucial component of thinking structure, image schema helps to explain how concepts are organized in the mind as well as the connections between mental and physical experiences. It is therefore a subtype of a cognitive domain and can be considered a subtype of the domain (Clausner & Croft, 2010). In contrast to certain realms such as philosophy, which may not always be imagistic, picture schema is consistently imagistic and schematic (Alonso et al., 2016). According to Langacker (1987), an image schema consists of three elements: a landmark, a trajectory, and a route that shows the asymmetry of the connection between the landmark and the trajectory. The main entity in these asymmetric interactions is the trajector (TR), whose spatial orientation is uncertain. It is considered the first participant in a highlighted relationship that establishes the setting of the scene or determines the extent of the scene by showing the location of the object, the speaker-listener, and the coordinate system (Thiering, 2011). The trajectory holds a special position as the most important focal point. According to Evans (2007), the secondary figure within a relational profile is the landmark (LM) that serves as both a reference frame and a less conspicuous component for the TR's direction of travel. The route is the distance traveled by the TR. The link between LM and TR has several facets. The possible relevant facets are the shape, size, LM and the TR dimensions, TR orientations (e.g., inclusion-exclusion, superior/inferior) about the LM, and other factors, as well as the absence or presence of contact between the LM and the TR, the TR and the LM distance, and so on.

The current study focuses on image schema results to investigate certain teaching strategies that support meaningful learning and teaching resources that draw inspiration from constructivism and cognitivism and attempt to investigate how students use and process information during the cognitive process. Furthermore, the methods of teaching foreign languages (FLT) and learning would be greatly impacted by cognitive linguistics (CL) inspired teaching techniques, which are meaningful learning applications that incorporate new ideas into the relevant concepts in cognitive structures. Evans et al. (2007) argue that CL investigates the relationship among the mind, human language, and socio-physical experience. These techniques try to improve FLT by offering clear explanations for a variety of grammatical and lexical events and by making connections between newly acquired information and relevant past knowledge stored in cognitive structures (Al Mubarak, 2017). Image schema approaches try to improve FLT by relating new knowledge to the related previous knowledge existing in a cognitive structure to make understanding many lexical and grammatical issues easy. The teaching of grammar has long been a major problem, and numerous methods and approaches have been offered for teaching grammar in particular, as well as the instruction of English as a second and foreign language in general. Even though these methods were previously developed, the utilization of these methods in classrooms is unusual and in its early stages (Hwang, 2023).

By considering all the facts about image schema, the goal of this study was to answer the following research question:

Do the image schema, and traditional instructions have differential effects on intermediate Kurdish EFL learners in English preposition learning?

METHODOLOGY

PARTICIPANTS

100 intermediate Kurdish L2 learners aged 18 to 20 were the participants of this study. The participants were chosen from the Lebanese French university in Kurdistan, Iraq. The researcher gave them a proficiency test and chose only the participants whose grades were +_1 above or below standard deviation and others were considered outliers. Then they were randomly divided into the experimental group (image schema group) and control group (rote learning). The participants were made aware of the aims of the study before the experiment. Each group had 50 students.

INSTRUMENTATION

Three measuring tools were utilized by the researchers to gather the study data: an OPT test to guarantee initial group homogeneity and two written tests used as a pre- and a post-test. Because the questions of both pretest and posttest were selected by test software, their validity was verified but their reliability calculated by Cronbach's alpha was 0.80.

1. The Oxford Placement Test (OPT) was employed to measure the participants' competence levels and the degree of performance of language learners in English. The OPT consists of 60 items to be answered in a restricted amount of time. Hence their scores at that test were averaged and compared to find out any probable significant differences. Learners who had very low or high average scores were excluded from the study. In other words, those who had +_1 above or below standard deviation were selected. Cronbach's alpha was employed to calculate the reliability of the test, and two experienced teachers confirmed its content validity. The obtained value for the reliability of the test was 0.82.

2. Pre-test: After splitting the classes into two groups, the participants took a preposition test consisting of 30 multiple-choice questions. The validity of the items, which were created by the original Exam View software, was confirmed. The exam lasted 25 minutes. The researcher chose the questions from TOP NOTCH, the third edition of the book by Joan Saslow & Allen Ascher at the intermediate level with the use of the Exam View test software because the participants' level was intermediate. Additionally, the participants did not even know the test items. That means they were not given the items before the test.
3. Posttest**:** To ascertain whether teaching prepositions using the image schema method had any discernible impact on the participants' overall preposition accomplishment, the same preposition achievement test (from the TOP NOTCH third edition) was used as the posttest; to decrease the familiarity degree, either the order or the content of the items was altered, but the prepositions were the same. This exam had a time limit of 25 minutes for 30 items. The test comprised 30 multiple-choice and completion tasks, close to the pre-test. The prepositions chosen at the pre-test stage were taught to the treatment group during the treatment, and have served as the basis for that exam.
4. The prepositions in, on, at, to, behind, in front of, between, beside, over, and under were used in all of the domains.

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	Spatial domain	**Temporal domain**	**Abstract domain**
IN	*in the house*	*in 1995*	*in love*
ON	*on the street*	*on Thursday*	*24-hour on call*
AT	*at the door* (A0D 2658)	*at 10.30 p.m.* (KIB 1007)	*at war* (A7C 1322)
TO	*Next to the table*	*5 to ten*	*It is to the point*
BEHIND	*Behind the door*		*The entire country is behind the times*
IN FRONT OF	*In front of the desk*		*In front of God*
BETWEEN	*Between the two rivers*	*between 9 and 10 o'clock*	*This is between me and you.*
BESIDE	*She sat beside her*		*Besides her role as a mother of three, Mary runs a charity organization.*
UNDER	*Under the desk*	*Under 18 (age)*	*He is under arrest*
OVER	*Over the city (plane)*	*Over fifty (age)*	*Overmind (science fiction)*

PROCEDURE

110 participants were examined to select and standardize them for the study and to ensure that all of the students were proficient at the same level. Thus, before the start of the course, a PET test was administered. To find out any likely significant discrepancies, their test results were averaged and compared. Learners with extremely high or low results were eliminated. Following the PET, learners who were +_1 above or below the standard deviation were chosen, and a number of samples became 100 learners. The researcher invited participants to actively participate in the experiment by outlining the purpose of the study and how tasks would be used. During the first session, the pre-test was given to each group by the researcher, who instructed them to finish it in 25 minutes. The post-test assessed the information the students had acquired throughout the new intermediate term, whereas the pre-test focused on their prior knowledge from intermediate and elementary school. Participants were told that their final score would not be affected by whatever they do in the research but positive marks would be awarded for high scores to encourage them to answer questions deliberately rather than haphazardly. The second class session marked the start of the therapy. Ten prepositions were taught to them in fifteen sessions. There were ten to fifteen minutes after each lesson to go over various questions and occasions in which speakers address location or time using prepositions. Occasionally, they held informal discussions or quick tests.

Fifteen lessons were taught to each group. Ten prepositions were used in each lesson. The spatial usages were covered in the first five classes, the temporal usages in the second five lessons, and the abstract usages in the third five lessons. Prepositional use was demonstrated using several instructional techniques for both groups. Students were given access to all resources via whiteboards or occasionally teacher-based drawings. After each class, the students were assigned tasks that consisted of multiple-choice and fill-in-the-blank questions. These tasks required them to complete sentences and were accompanied by both hand-drawn pictures and written explanations. Despite receiving varied instruction, both groups performed the same activities. After the students completed their tasks, the teacher reviewed their responses and clarified any discrepancies with them.

For instance, "CONTAINMENT" is the image schema for the preposition 'in'. It represents a container with a specific content, a given orientation of in or out, and a full or empty sense (Evans, 2007). In the teaching materials, the Landmark (LM) was colored blue using classroom markers on the whiteboard, and the Trajector (TR) was colored red as the core square to represent the image schema of CONTAINMENT. The metaphorical mappings from the spatial realm to the abstract and temporal domains were illustrated using this image schema. Since semantics is essential in cognitive linguistics, the students were required to pay attention to the meaning so the experimental group was instructed based on CL-based instructions. To help the experimental group's learners fill in the blanks or select the best option for the offered questions, the researcher has attempted to educate them to be aware of the landmark (LM) of the questions and the context.

"Ali is swimming in the pool" is the chosen sentence in the spatial realm. In this sentence, LM is the pool, the TR is Ali is swimming, and the preposition in is used to spatially relate the TR to the LM. The LM indicates the idea of a container because of CONTAINMENT as the main image schema of prepositions in. In the temporal domain, the sentence "They traveled around the world in 1995" may likewise be explained using the same image schema. This time, the year 1995 the LM is regarded as a container for the TR when they traveled around the world. Thus, CONTAINMENT is metaphorically mapped from the spatial realm (source domain) to the temporal realm (target domain). In the abstract domain, the sentence "In my opinion, the lesson was interesting" can be illustrated through the same image schema. The TR is the lesson was interesting enclosed in the LM (my opinion) that is the container. Thus, once more through metaphorical mapping, the meaning of the preposition in the abstract realm (target domain) is understood by using the preposition-related image schema within the spatial realm. In summary, the CL-inspired approach can explain the three sample sentences. This approach states that a coherent fixed knowledge context of in is provided by the cognitive domain, the LM and the TR of the CONTAINMENT show the spatial relation and CONTAINMENT also extends this concrete structure to the abstract and the temporal domains.

The conventional methods were the basis of the control group's instructional materials. Lists of ten prepositions with various definitions (OALD, 2005) and examples for each target preposition were given to the students. 15 lessons covering the three domains (abstract, temporal, and spatial) were taught to provide comparable instructional set-ups. However students were not aware of this classification. For example, to teach the spatial usage of 10 prepositions, the definitions of each preposition and their examples were explained by the teacher. A week after the final session, a post-test was given to both groups and their achievements for all ten English prepositions were measured. Similar test questions and procedures were used in both pre and post-tests.

DESIGN

There was one experimental group and one control group in this quasi-experimental investigation. For ten prepositions, the researcher used three types of abstract, and temporal domains for both groups. OALD instruction based on rote learning was used in the control group while the experimental group received instruction through the cognitive linguistic approach that is image schema. Only the definitions of the prepositions from dictionaries were given to the control group, who also had to utilize the specified prepositions properly after reviewing a few instances.

RESULTS AND DISCUSSION

RESULTS OF OXFORD PLACEMENT TEST

The reading and writing subsections of Oxford Placement Test (OPT) were used to check the participants' homogeneity regarding their proficiency level. Table 1 shows the descriptive statistics of the participants' proficiency test scores.

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Table 1
Descriptive Statistics of Iraqi Intermediate Participants' Proficiency Test Scores

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Oxford Placement Test Scores	Control Group	50.00	32.71	8.77	1.18
	Experimental Group	50.00	32.07	6.77	.92

As Table 1 displays, the control group's mean score and standard deviation were 32.71 and 8.77 respectively (M= 32.71, SD= 8.77) but the experimental group's mean score and standard deviation were 32.07 and 6.77 (M= 32.07, SD= 6.77). An independent samples t-test was employed to determine if participants had the same level of proficiency. Table 2 displays the findings of the independent samples t-test.

Table 2
Independent Samples T-test for Iraqi Intermediate Participants' Proficiency OPT Test Scores

Independent Samples 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
Oxford Placement Test Scores	Equal variances assumed	3.42	.07	-.46	107.00	.65	.67	1.46	-2.21	3.56
	Equal variances not assumed			-.46	97.00	.64	.67	1.45	-2.21	3.55

Regarding Table 2, equal variances were assumed because the significant value in Levene's test for equality of variances was .07. Since the P value is higher than the alpha level .05; t (107) = -.46, p=.65, there was no significant difference between OPT scores of the participants. To put it differently, participants had similar proficiency levels.

RESULTS OF THE PRETEST PREPOSITION LEARNING

To compare participants' pretest preposition learning mean scores, descriptive statistics were employed. The results are shown in Table 3.

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Table 3
Descriptive Statistics of Iraqi Intermediate Participants' Pretest Preposition Learning Scores

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest of Preposition Learning	Control Group	50	27.40	8.26	1.11
	Experimental Group	50	27.63	7.00	.95

As shown in Table 3, the control group's mean score and standard deviation in the preposition pretest were M=27.40, and SD=8.26, and those of the experimental group were M=27.63, and SD=7.00. It means that the intermediate participants' pretest preposition learning scores were somehow similar. Checking the normality distribution of both groups' pretest preposition learning scores was necessary before running an independent samples t-test so a one-sample kolmogorov-smirnov was conducted. The results are illustrated in Table 4.

Table 4
One-Sample Kolmogorov-Smirnov Test for Iraqi Intermediate Participants' Pretest Preposition Scores in Control and Experimental Groups

		CPIS	EPIS
N		50	50
Normal Parameters[a,b]	Mean	27.4000	27.6296
	Std. Deviation	8.25878	7.00215
Most Extreme Differences	Absolute	.160	.114
	Positive	.160	.066
	Negative	-.087	-.114
Kolmogorov-Smirnov Z		1.185	.838
Asymp. Sig. (2-tailed)		.121	.484

a. Test distribution is Normal.
b. Calculated from data.

As Table 4 shows, the p-value for the pretest scores in the control group was .121 (p=.121 >.05), and that of the participants in the experimental group was .484 (p= .484>.05), indicating the normal distribution of Iraqi intermediate participants' pretest preposition learning scores. As a result, the normality assumption was met. Therefore, an independent samples t-test was run to see any significant difference between the participants' pretest preposition scores in both groups. Table 5 shows the independent samples t-test results.

Table 5
Independent Samples T-test for Iraqi Intermediate Participants' Pretest Preposition Scores

Independent Samples 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
Pre of IS	Equal variances assumed	1.928	.168	-.156	107	.876	-.230	1.468	-3.139	2.680
	Equal variances not assumed			-.157	104.788	.876	-.230	1.466	-3.136	2.677

Table 5 reveals that the equal variances were assumed because the p-value in Levenes' Test for pretest preposition learning scores was .168> .05. So, both groups' pretest preposition scores did not show a significant difference, t (107) -.156, p= .876> .05. In other words, the intermediate participants had the same preposition knowledge.

RESULTS OF THE RESEARCH QUESTION

The research question was stated as the following:

Do the image schema, and traditional instructions have differential effects on intermediate Kurdish EFL learners in learning English prepositions?

After the intervention, a post-test was given to both groups. So the descriptive statistics was done for the post-test preposition scores. The results are given in Table 6.

Table 6
Descriptive Statistics of Iraqi Intermediate Participants' Post-test Preposition Learning Scores

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest of Preposition Learning	Control Group	50	33.24	8.124	1.095
	Experimental Group	50	35.39	6.744	.918

As Table 6 shows, the control group's mean score and standard deviation in the preposition post-test were 33.24 and 8.124 (M=33.24, SD=8.124) but the experimental group's mean score and standard deviation were 35.39 and 6.744 (M= 35.39, SD= 6.744). That is why, the experimental group did better than the control group.

As well, to check the normality distribution assumption of Iraqi intermediate participants' post-test preposition scores between control and experimental groups, one Sample Kolmogorov-Smirnov test was used. Table 7 shows the results.

Table 7
One-Sample Kolmogorov-Smirnov Test for Iraqi Intermediate Participants' Post-test Preposition Scores in the Control and Experimental Groups.

		CGISPOST	EGISPOST
N		50	50
Normal Parameters[a,b]	Mean	33.2364	35.3889
	Std. Deviation	8.12396	6.74444
Most Extreme Differences	Absolute	.142	.123
	Positive	.142	.084
	Negative	-.119	-.123
Kolmogorov-Smirnov Z		1.055	.906
Asymp. Sig. (2-tailed)		.215	.385

a. Test distribution is Normal.
b. Calculated from data.

As Table 7 shows, the significant value of the control group's post-test preposition scores was .215 (p= .215> .05) and that of the experimental group was

.385 (p= .385> .05). It means that a normal distribution was observed in the participants' post-test preposition scores.

On the other hand, the parametric test of the Independent samples t-test was conducted to check the significant difference between Iraqi intermediate participants' post-test preposition scores. The results are demonstrated in Table 8.

Table 8

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Independent Samples T-test for Iraqi Intermediate Participants' Post-test Preposition Scores

		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
Post of IS	Equal variances assumed	2.022	.158	-1.504	107	.136	-2.15253	1.43154	-4.99039	.68534
	Equal variances not assumed			-1.506	104.139	.135	-2.15253	1.42910	-4.98645	.68140

As Table 8 demonstrates, Levene's test for equality of variances produced p value of .158. So, the equal variances were assumed. Because of t (107) = -1.504, p= .136<.05, it indicates that both groups' post-test preposition scores did not show a significant difference. So, a positive answer to the research question was found.

RESULTS OF PREPOSITION LEARNING IN ALL OF THE DOMAINS

Descriptive statistics was used to compare the mean scores of both groups' pretest and posttest of all of the domains in preposition learning scores. The results are displayed in Table 9.

Table 9
Descriptive Statistics of Iraqi Intermediate Participants' Pretest and posttest of all of the domains in Preposition Learning Scores

as items for domains	Experimental group (*n*=50)		Control group (*n*=50)	
	M	*SD*	*M*	*SD*
Spatial domain				
Pre-test	7.89	2.60	8.46	2.68
Post-test	10.91	2.60	10.15	3.02
Temporal domain				
Pre-test	9.30	2.59	9.74	2.36
Post-test	12.65	2.45	11.20	2.94
Abstract domain				
Pre-test	9.78	2.63	10.02	2.70
Post-test	13.48	2.37	12.06	2.74

1. As Table 9 shows, the control group's mean score and standard deviation in the pretest of the spatial domain were 8.46 and 2.68 (M= 8.46, SD= 2.68) and the experimental group's were 7.89 and 2.60 (M= 7.89, SD= 2.60). While the control group's mean score and standard deviation in the post-test were 8 10.15 and 3.02 (M= 10.15, SD= 3.02), the experimental group's ones were 10.91 and 2.60 (M= 10.91, SD= 2.60).

2. Moreover, the control group's pretest mean score in the temporal domain was 9.74 with a standard deviation of 2.36 (M= 9.74, SD= 2.36) and the experimental group was 9.30 with a standard deviation of 2.59 (M= 9.30, SD= 2.59). While the control group's post-test mean score in the temporal domain was 11.20 with a standard deviation of 2.94 (M= 11.20, SD= 2.94), the experimental groups was 12.65 with a standard deviation of 2.45 (M= 12.65, SD= 2.45).

3. However, the control group's pretest mean score in the abstract domain was 10.02 with a standard deviation of 10.02 (M= 9.74, SD= 2.70) and the experimental group was 9.78 with a standard deviation of 2.63 (M= 9.78, SD= 2.63). While the control group's posttest mean score in the abstract domain was 12.06 with a standard deviation of 2.74 (M= 12.06, SD= 2.74), the experimental group' was 13.48 with a standard deviation of 2.37 (M= 13.48, SD= 2.37).

Highly significant improvements were discovered in the items within the three domains. Improvements were more significant as they moved from the amorphous applications in the realm of the abstract to the specific applications in the spatial realm. The experimental group participants' improvement was much greater than the control group, leading to enhancements in all three categories.

1. The abstract domain was where the experimental groups made the biggest gains; nevertheless, gains in both temporal and spatial domains were moderate and comparable. While the control group showed moderate improvements in the abstract domain, their improvement in the temporal domain was moderate too but moderately lower in the spatial realm.
2. The spatial domain is where the image schema has its roots. Participants in the experimental group demonstrated some meaningful changes with the clearest visual examples. The individuals in the control group who performed better already have sufficient prior knowledge in the spatial domain. The conventional memorization-based techniques help in organizing the usages so they don't improve the performance of individuals when they come across familiar applications.
3. According to this, when prior information interfered with learning, individuals with greater skill levels tended to avoid using traditional rote learning to retain the knowledge they had previously learned.
4. As a result, the individuals in the control groups showed lower spatial accomplishments and lower temporal advancements. Meaningful learning inspired by CL and standard rote learning may have various roles to play in the acquisition of spatial and temporal usages, which may be related to the varying amounts of prior information in the three domains. This is how the outstanding improvement outcomes may have come about. Despite having more previous information in the spatial, temporal, and abstract domains, the participants' previous information regarding the abstract realm was the least in the current research.

DISCUSSION

Positive findings were obtained from the statistical calculation of the two learning approaches, in other words, the participants of the experimental group performed better in the post-test than participants of the control group. Previous research has pointed out the limitations of rote learning, which is based on repetition and does not incorporate new information with the relevant one within the cognitive structure (Wijaya & Ong, 2018), as well as the significance of meaningful learning that involves the process of mentally storing items linked to pre-existing cognitive structures (Novak & Cañas, 2009). The results that all items using CL-inspired meaningful learning yielded noticeably higher accomplishment supported the findings of earlier research and highlighted the benefits of meaningful learning inspired by CL. The learning continuum was imposed on meaningful learning inspired by CL due to the employing CL findings. Initially, image schemas were provided to the students by CL-inspired meaningful learning that assisted them to understand the information through visual pictures and written texts were provided too. Since in this step the written texts and visual images are provided, it corresponds to the visual register. The teachers also went over how to apply image schemas to the sample sentences in this stage, so this step matches the auditory register. All of these processes came to an end in the sensory register. It means that the new information was engaged in the first comprehension phase through the auditory and visual channels. Subsequently, to find the relations between the questions in the instructional materials and in the tests, and image schemas, the conceptual metaphor was utilized.

Prepositional meaning comprehension involved two segments: either the non-metaphorical prepositional meaning was comprehended directly in the source realm, or the metaphorical sense of the preposition was grasped through using inferences of the source domain in the target one. The working memory process brought this operation to an end. In the end, after processing the complete procedure, the new information was integrated into the cognitive structures by connecting to the previous information in long-term memory, and then acquiring the new information took place. Here, both conceptual and cognitive domains have great functions. First, the cognitive domain offers proof

for the classification of knowledge, which might make it easier to incorporate new information into the preexisting cognitive framework. Second, the spatial domain offers the greatest amount of previous information for integrating with new information. It illustrated the fundamental elements affecting English preposition learning. As a result, the participants of the experimental group processed the entire process and benefited from learning English prepositions through meaningful learning inspired by CL.

The spatial applications within the spatial realm facilitate connecting knowledge in short-term memory to mental frameworks retrieved from long-term memory. In language, the concept of space holds a special place as a main category of ontology. (Ming, 2011). As a result, spatial domain understanding is crucial to the cognitive realm (Gou, 2004). Prepositions are typically used in English to describe spatial layouts (Kemmerer, 2005). Learning to classify spatial relationships by the spatial conventional norms in the cognitive schemata of the first language is the process of acquiring the spatial prepositions in the first language (Song et al., 2015). The spatial system reforming in the cognitive schemata by target language requirements is the process of acquiring spatial semantics in a second language (Wong et al., 2018). Our space perception, body sensations, perception of objects in space, and understanding of forces on the objects provide the fundamental frameworks that allow us to conceptualize more abstract cognitive domains. However, traditional memorization techniques only focus on memorizing information without truly understanding it.

It is easy to forget such acquired knowledge. As a result, the experimental group participants exposed to meaningful learning inspired by CL displayed improvements in preposition learning in the post-test in comparison with the participants of the control group exposed to conventional memorization-based learning. With a particular emphasis on English prepositions, conventional rote learning involved providing a clear definition for each preposition. The participants just memorized the material for homework assignments and future tests without actually going through the process of thinking. They failed to make connections between the different meanings of a single preposition because they omitted the process of incorporating the new information into their existing knowledge. Such learned information is readily forgotten. Consequently, the experimental group participants who were exposed to meaningful learning inspired by CL achieved significantly superior results on the post-test than the control group participants who were exposed to rote learning.

Theoretically, these findings are supported by both the theory of image schemas and the Theory of Conceptual Metaphors and Domain Mapping. According to image schemas theory, target items' semantics are presented in image schemas form. "An image schema is a relatively abstract conceptual representation that arises directly from our everyday interaction with and observation of the world around us [and it] derive[s] from sensory and perceptual experience" (Evans, 2007, p. 106). It means that the world is experienced by humans through observation and sense interactions so conceptual representation of experiences is formed. According to Hung et al. (2018), humans' world experiences are emphasized by the Theory of Conceptual Metaphors and Domain Mapping. It was explained that conceptual metaphors are greatly used in everyday conversations. It was also asserted that prepositions can transfer from one domain to another domain but Hung (2017) believes that since this transfer is not always direct, English prepositions' spatial and metaphorical meanings can be taught separately as it was done in the present study.

The findings of the present research align with those of Ghanbari and Mahmoodian (2023), Bouabida (2020), Badamdari et al. (2022), Hung et al. (2018), and Hung (2017). Ghanbari and Mahmoodian (2023) carried out a study to investigate the impacts of software strategies and image schemas on students' learning of English prepositions. The findings revealed that the experimental groups that received software strategies and image schemas outperformed the control group that received traditional methods of teaching prepositions in learning and retention of the prepositions. Surprisingly, the experimental group exposed to image schema treatment showed a significant efficiency in prepositions in comparison with the second experimental group exposed to software strategies.

Similarly, Bouabida (2020) examined the effects of a teaching method combining Corpus linguistics and Cognitive Linguistics insights on learning English spatial prepositions. IPDDL instruction involving image schema, the principled polysemy, and the data-driven learning model was given to the experimental group but traditional instruction was given to the control group. The analysis of data showed that the IPDDL method of teaching significantly influenced students' acquisition of spatial prepositions.

Moreover, Badamdari et al. (2022) focused on Persian students' learning of some frequency concepts of the preposition "be". For this purpose, 50 female non-Persian learners were selected by proficiency test and were randomly assigned to experimental and control groups. The findings indicated that the experimental group who received the cognitive method of image schemas showed significant gains over the control group which was under the traditional method of teaching.

In a similar study, Hung et al. (2018) carried out a study for four weeks during which students first learned the spatial meanings and then the metaphorical meanings of ten prepositions through cognitive linguistics-based instruction. Students' responses to the questionnaires at the end of treatment showed that students had positive attitudes regarding the treatment and believed that the instruction positively influenced their memories of the prepositions. They also asserted that image schemas use was effective in teaching the semantics of the prepositions. Finally, Hung (2017) did a quasi-experimental study employing cognitive linguistics to teach English prepositions. The experimental group was taught spatial and metaphorical meanings through the image schema method. The results proved that the experimental group's performance was better than the control group in terms of both spatial and metaphorical meanings.

CONCLUSION AND IMPLICATIONS

In conclusion, teaching English prepositions to students at an intermediate proficiency level, incorporating the CL approach of teaching methodology and learning had significant effects compared to traditional rote learning, which was reflected in the achievements and improvements. The findings of this study, which took into account both the meaningful learning theories and the image schema model, support the conclusions of a significant amount of earlier research in this area. As Liu and Tsai (2021) pointed out, teaching methods employing CL can "inform, inspire, and enhance language pedagogy" (p. 543).

Because the experimental group participants were capable of formal operational thinking, the benefits of meaningful learning inspired by CL became evident in the improvements and accomplishments of the learners. In nature, individuals' accomplishments and advances at varying proficiency levels are largely influenced by their past knowledge. For example, the previous knowledge of how prepositions are used in the space domain, and the number of relevant questions within tests can impact prepositional usage learning in all three domains. Additionally, students may perform better and make more progress if the teaching materials contain easier-to-understand image schemas. If learners learn the underlying image schemas, they will deeply understand the meanings of the words. Moreover, Yu (2022) believes that if learners understand the cognitive mechanisms of meaning formation of prepositions, they will easily learn and use them in comparison with those learners who are not taught. When learners are instructed by image schemas, they can utilize many resources to understand the meanings of prepositions rather than only using their first-language equivalents. The reason is that the words in different languages do not have strictly equal meanings and there are some semantic differences among seemingly equivalent words. This issue is not taken into account in traditional teaching methods.

It should be mentioned that the experimental group spoke more fluently since they didn't stop to think about the appropriate prepositions to utilize while speaking. Additionally, they completed the post-test exam paper more quickly. This means that the control group had a longer post-test duration than the experimental group. The study also implies that it would be beneficial for language policymakers in Iraq to take image schema into account and work to systematize the schools from the start to improve students' cognition. It is vital to emphasize that to establish such a policy, teachers must be consulted since they have a crucial function in both the language used in the class and the application of image schema learning. To improve propositional learning and the teaching of intermediate courses, book or curriculum designers may be able to create or launch books based on the model.

REFERENCES

Aajami, R.F. (2022). A cognitive linguistic study of the English prepositions above, on, and over. *Journal of Language and Linguistic Studies, 18*(1), 738-751. Doi: 10.52462/jlls.216

Al Mubarak, A. A. (2017). The complications of learning and understanding English prepositions among students at Al Imam Al Mahdi University in Sudan. *Journal of Language Teaching and Research, 8*(5), 871-880.

Alonso, A. R., Cadierno, T., & Jarvis, S. (2016). Cross-linguistic influence in the acquisition of spatial prepositions in English as a foreign language. In A. R. Alonso (Ed.) *Crosslinguistic influence in second language acquisition* (pp. 93-120). Clevedon: Multilingual Matters.

Ausubel, D. P. (1968). *Educational psychology: a cognitive view*. New York: Holt, Rinehart, and Winston.

Ausubel, D. P. (2000). *The acquisition and retention of knowledge: a cognitive view.* Boston: Kluwer Academic Publishers.

Badamdari, Z., Alizade, A., Eghbali, E., & Vahidi Ferdowsi, T. (2022). The use of image schema in teaching prepositions, the case study of the preposition "Be" in Persian. *Language Related Research, 13*(1), 597-628.

Boers, F. (2011). Cognitive semantic ways of teaching figurative phrases: An assessment. *Review of Cognitive Linguistics, 9*(1), 227-261.

Bouabida, N. (2020). The effect of data-driven learning and image-schema based polysemy networks instruction on learning spatial prepositions of verticality: The case of Moroccan EFL learners. *JURNAL ARBITRER, 7*(1), 62-70.

Cho, K. (2010). Fostering the acquisition of English prepositions by Japanese learners with networks and prototypes. In S. D. Knop, F. Boers, & A. D. Rycker (Eds.). *Fostering language teaching efficiency through cognitive linguistics* (pp. 259-275). Berlin: De Gruyter Mouton.

Clausner, T., & Croft, W. (2010). Productivity and schematicity in metaphors. *Cognitive Science: A Multidisciplinary Journal, 21*(3): 247-282.

Cooper, S. (2009). Theories of Learning in Educational Psychology. In David Ausubel (Ed.), *Meaningful Verbal Learning & Subsumption Theory.* http://www.lifecircles inc.com/Learningtheories/constructivism/ausubel.html

Currie, Q. T. (2008). *Animation as reality: factors impacting cognitive load in studio-based E-learning*. [Doctoral dissertation, Capella University, USA].

Evans, V. (2007). *A glossary of cognitive linguistics.* Utah: University of Utah Press.

Evans, V., & Green, M. (2007). *Cognitive linguistics: An Introduction.* Edinburgh: Edinburgh University Press.

Ghanbari, A., & Mahmoodian, S. (2023). Language teaching software and image schemas in teaching English prepositions: The case study of Iranian pre-intermediate EFL learners. *In 10th International Conference on Language, Literature, History, and Civilization*. Tbilisi- Georgia.

Gou, R. L. (2004).The cognitive basis of Chinese local words “Shang" and "Xia” and teaching Chinese language as a Second Language. *Applied Linguistics, (4)*, 32-36.

Hung, B. P. (2017). Applying cognitive linguistics to teaching English prepositions. *In The 64th TEFLIN Conference Proceedings*. Yogyakarta: UNY Press.

Hung, B. P.,Truong, V., & Nguyen, N. V. (2018). Students’ responses to CL-Based teaching of English prepositions. *Eurasian Journal of Educational Research, 73*, 41-58.

Hwang, H. (2023). Image-schema-based-instruction enhanced L2 construction learning with the optimal balance between attention to form and meaning. *De Gruyte Mouton*. https://doi.org/10.1515/iral-2023-0015

Jarvis, S., & Pavlenko, A. (2008). *Crosslinguistic influence in language and cognition*. New York/London: Routledge.

Jonassen, D.H. & Land, S. (2002). Preface in theoretical foundations of learning Environments. In Jonassen, D. H., & Land, S. M. (Ed.), *Theoretical Foundations of Learning Environments.* Lawrence Erlbaum Associates.

Kemmerer, D. (2005). The spatial and temporal meanings of English prepositions can be independently impaired. *Neuropsychologia, 43*(5), 797-806.

Kroll, J. F., Dussias, P. E., Bice, K. & Perrotti, L. (2015). Bilingualism, mind, and brain. *Journal of Language and Linguistic Studies, 13*(2), 681-719.

Langacker, R. W. (1987). *Foundations of cognitive grammar*: *Theoretical Prerequisites*. Stanford, California: Standford University Press.

Liu, D., & Tsai, T.H. (2021). Cognitive linguistics and language pedagogy. In X. Wen & J. R. Taylor (Eds.), *The Routledge Handbook of cognitive linguistics* (pp. 543-555). Routledge. https://doi.org/10.4324/9781351034708-36

Ma, S. H. (2005). *The acquisition of English spatial prepositional semantics by Chinese EFL learners*. [Doctoral dissertation, Guangdong University of Foreign Studies, Guangzhou, China].

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist, 38(1),* 43-52.

Ming, H. (2011). *A cognitive semantic study of prepositions based on a comparison with the Chinese prepositional phrase Zai Shang*. [Doctoral dissertation, Shanghai International Studies University, Shanghai, China].

Murphy, R. (2013). *English grammar in use*. Cambridge: Cambridge University Press.

Novak, J. D., & Cañas, A. J. (2006). The Origins of the Concept Mapping Tool and the Continuing Evolution of the Tool. *Information Visualization*, *5*(3), 175-184. https://doi.org/10.1057/palgrave.ivs.9500126

Skrzypek, A. & Singleton, D. (2013). Productive knowledge of English collocations in adult Polish learners: The role of short-term memory. *Vigo International Journal of Applied Linguistics, 10*, 105-129.

Song, X., Schnotz, W. & Juchem-Grundmann, C. (2015). A cognitive linguistic approach to teaching English prepositions. In W. Schnotz, A. Kauertz, H. Ludwig, A. Müller, & J. Pretsch (Eds), *Multidisciplinary Research on Teaching and Learning* (pp.109-128). London: Palgrave Macmillan.

Thiering, M. (2011). Figure-ground reversals in language. *Gestalt theory, 33* (34), 245-276.

Ticio, E. & Avram, L. (2015). The acquisition of differential object marking in Spanish and Romanian: semantic scales or semantic features? *Revue Romaine de Linguistique*, *4*, 383-402.

Tyler, A. (2012). *Cognitive linguistics and Second Language Learning: Theoretical Basics and Experimental Evidence*. London, New York: Routledge.

Wijaya, D., & Ong, G. (2018). Applying Cognitive Linguistics to teaching English prepositions in the EFL classroom. *Indonesian Journal of Applied Linguistics*, *8*(1), 1-10.

Wong, M. H., Zhao, H., & MacWhinney, B. (2018). A cognitive linguistics application for second language pedagogy: The English preposition tutor. *A Journal of Research in Language Studies, 68*(2), 438-468.

Yu, J. (2022). A brief review of the effects of image schema theory on the acquisition of polysemy. *Journal of Language Teaching, 2*(4), 1-6