Developing EFL Learners' Vocabulary Repertoire Through Semantic Relations Techniques

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Abstract—The study investigates the impact of teaching vocabulary through semantic relations (i.e. including hyponymy, synonymy, antonymy, polysemy, homonymy and metonyms) on the breadth and depth of EFL learners' vocabulary knowledge. A convenient sample of 50 freshman EFL learners from a state university in Jordan was recruited. The study followed an experimental approach; data were collected through pre- and post-tests over an academic term. An interview was also conducted to elicit students' attitudes toward this vocabulary-learning strategy. The results of the ANOVA test have revealed that Jordanian EFL learners find certain difficulties concerning the identification and production of all semantic relations. They scored low in identifying semantic fields properly though they were more aware of synonyms and antonyms than others. The T-test analysis of the data revealed that the degree of awareness of the major types of semantic relations significantly differed between both tests. This implies that using this strategy has improved students' semantic awareness. Besides, students have shown positive attitudes towards using this technique asserting that it contributes to the development of their mental lexicon. The study has many pedagogical implications and recommendations for further research.

Index Terms—EFL, semantic relations, mental lexicons storage

I. INTRODUCTION

Vocabulary acquisition is considered fundamental for building language proficiency (Ilmiddinovich, 2021; Nation, 2000; Alam, 2023). Vocabulary is essential for the communication and comprehension of languages. However, they constitute a main obstacle that several students encounter in learning a language (Afzal, 2019; Mohammed & Ahmed, 2019). The difficulty of learning vocabularies resides in their very nature as this entails realizing their forms, connotations, denotations, and correct usage in meaningful contexts (Odinokaya et al., 2021).

Though most Jordanian undergraduate EFL learners can understand the English language, the majority of them are still classified at a low level of competency. They face problems in effectively communicating, and developing their ideas in speaking and in writing due to the lack of adequate repertoire of English vocabulary. Such a problem could be ascribed to the traditional way of teaching which focuses on passive learning (Mapesos, 2017) which is considered ineffective for developing learners' communication and critical thinking (Richmond, 2007). Therefore, effective techniques for appropriately learning and storing vocabulary are crucial in this aspect (Gizoli & Bedri, 2015) to form a source of power for better language users.

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Schmitt (2019) claims that developing a practical model of vocabulary acquisition is a fruitful research area. Research reveals that vocabulary can be learned directly and indirectly (Armbruster et al., 2003). Most learners acquire vocabulary through indirect repeated or multiple exposures to them in different contexts by listening, talking and reading (Lestari & Hardiyanti, 2020; Perez, 2022). Exercising these skills results in long-term vocabulary improvement (Cunningham & Stanovich, 1998; Kamil & Hiebert, 2005). Learners also acquire new vocabulary through explicit instruction such as repeated multiple readings, word histories, computer-based, semantic mapping and restructuring the task (Ullrich, 2021; Burt et al., 2022). Indirect instruction of vocabulary is found useful especially for those with low primary vocabulary awareness levels since it enables teachers to focus on certain words that learners would use independently to facilitate understanding, thus motivating learners to develop more word consciousness (Yaghoubi & Seyyedi, 2017; Saragih, 2019). Semantic mapping is another effective approach for teaching vocabulary (Saragih, 2019; Udaya, 2022; Fitriani et al., 2022; Wahab & Astri, 2022). It involves activities that students require to map vocabulary to other associated words to increase learners' knowledge of particular words and their closely associated meanings. Inferencing strategies are also desirable because they enhance comprehension of texts as a whole (Shuang, 2022). They encompass making cognizant assumptions of the connotation of a word based on their linguistic knowledge and general knowledge of the world besides benefiting from obtainable linguistic cues in the texts.

Building a good semantic model is based on having a good cognitive structure demonstrating certain aspects or words and representing their various linguistic, psychological and pragmatic features. Teaching vocabulary through associating them with other words is found effective. Term association is a concept introduced by Sinopalnikova (2004) reflecting the sort of connection between ideas and words existing in the human mind where one entity entails the appearance of the other in the mind. It is influenced by many variables among which are familiarity and context. The more familiar the words, the faster the related words appear in the mind (Nair et al., 2020).

Nation (2000) calls for teaching semantically related words due to many reasons. They are easier to retrieve from memory, help learners figure out meanings, organize knowledge and store their information in their mind. Despite that, semantic relations still pose great difficulty to learners as they deviate from the literal meaning in some cases (Allott & Textor, 2022). Such associations between words signify the hidden links between them, their visualization and related thoughts. This is termed by Kess (1992) as a word association system, which is comparable to a spider web in which vocabularies in the mental network are related to other words. Examining semantic errors raises teachers' awareness of these errors and directs them to the best way to address them in classrooms. Though linking words to their rational semantic senses is perceived as an effective learning strategy that enriches learners' mental lexicon, it seems the least frequently vocabulary learning-teaching strategy employed in classrooms (Altay, 2017).

Researchers claim that receptive competence is more refined by language learners than productive competence and they are not corollary (Richards, 2015; Jaashan, 2022). They passively learn vocabularies at the beginning and then actively produce them. Nonetheless, the taxonomy to name and categorize words seems to be contradictory on numerous occasions, which may result in some impediments. The changeable nature of what we call context offers only obscure descriptions (Storjohann, 2010). These linguistic ambiguities and conflict lead to further problems in language education, but semantic relational mapping may provide a panacea. Despite that, Alaee (2022, p. 87) argues "Among various word learning strategies, semantic network practices have received the least attention from researchers". The present study addresses researchers' (Sathientharadol, 2020; Udaya, 2022; Alaee, 2022) call for more experimental research to prove the effectiveness of the semantic relations approach that would be more effective than others would.

Nataliya and Elena (2020, p. 105) claim that "Foreign language acquisition is notoriously constrained by learners' lack of awareness of the systemic relations that are obtained among stable multiple-unit semantic items". Scholars support intentional learning of the most frequently needed words using certain strategies (Sökmen, 1997; Ellis, 2002). Despite the plethora of vocabulary research in language learning, researchers claim that there have been very few studies on semantic awareness in L2 or FL learning (Fitzpatrick & Clenton, 2017; Akbarian et al., 2020). Akbarian et al. (2020) call for more research on very important factors such as the prompt, instruction, and vocabulary level whose potential effect on learners' vocabulary production cannot be ignored in language acquisition. Thus, this study aims to bridge the gap by answering the following research questions:

To what extent are Jordanian EFL learners aware of semantic relations?

Is there a significant impact of using semantic relations techniques on students' vocabulary knowledge and reading competency?

What are Jordanian EFL learners' attitudes toward using semantic relations techniques in vocabulary learning and instruction?

The significance of the study stems from the fact that it touches on a significant topic concerning semantic relations strategy, which can be used to help students learn new words and add a great deal to their diction. Vocabulary acquisition is the source of enhancing learners' language skills and proficiency in general. Researchers have proved that acquiring lexical relations is essential for constructing fortified learners' schemata as a solid basis required for having large-scale and long-term vocabulary growth (Altay, 2017; Ullrich, 2021; Burt et al., 2022). Akbarian et al. (2020) call for more studies on lexical availability as they can greatly contribute to a better recognition of learners' productive vocabulary knowledge. It is expected that the results of this study are of chief significance to various research fields among which are language acquisition, psycholinguistics, semantics etc.

To the best of the researchers' knowledge, this study is the first of its kind that investigates Jordanian EFL awareness of all semantic relations, the impact of using these techniques on cultivating their vocabulary repertoire and their attitudes toward using this technique in language instruction. Identifying the students' levels of awareness and sources of difficulties concerning a particular aspect of vocabulary acquisition is considered a crucial step toward solving them. Successful linguistic understanding entails perpetually sorting out semantic ambiguity (Nair et al., 2020). Higher communicative efficiency could be achieved through resolving challenges concerning the use and reusing of semantically related and contextually appropriate words (Piantadosi et al., 2012). In light of this, certain suitable teaching and learning strategies could be proposed for improving linguistic and meta-linguistic skills in the target language.

II. THEORETICAL FRAMEWORK

The semantic field is concerned with a system of words that are connected since they share the same area of relation and knowledge or interest (Boran, 2018). The Semantic Field Theory was developed by Ferdinand de Saussure's notion of language as an interconnected system of elements which is considered a new phase in the history of semantics. It is defined as"... the view that the vocabulary of a language is a system of interrelated lexical networks, and not an inventory of independent items" (Crystal, 1992, pp. 346-347). It plays a great role in facilitating learning vocabulary efficaciously and systematically by constituting a thorough constantly evolving lexical system (Beck et al., 2013; Gao & Xu, 2013; Faraj, 2022).

Semantic relations are so named because they involve relationships between senses whereas lexical relations can be instances of semantic relations as not only meaning but also morphological form or collocational patterns of the lexemes are associated (Murphy, 2010). Semantic relations can be classified under 'has-a' relations and 'is-a' relations (Altay, 2017) including metronyms, synonyms, antonyms, hyponyms, homonyms or homophones, heteronyms and polysemous words. Metonyms are words used as a substitute for related things such as brass, which means military officers. Synonyms are different words but with almost similar meanings such as sick and ill whereas antonyms are words with opposite meanings such as alive-dead. Hyponyms are words referring to components of a larger category such as football and sports. Homonyms or homophones refer to words that are different in meaning but are pronounced the same such as tail–tale. Heteronyms are words that are spelled the same but pronounced differently such as lead (i.e. guide) – lead (i.e. metal)/led. Homographs refer to words that are spelled the same but have different meanings and may have different pronunciations such as quail (i.e. to cower) and quail (i.e. a type of bird). Polysemous words with multiple meanings are related conceptually in some way such as bear (i.e. tolerate) – bear (i.e. carry).

Researchers (Boran, 2018; Stringer, 2019; Hakimova et al., 2020; Dwihastuti et al., 2022) recommend applying semantic relations for efficacious EFL vocabulary teaching as it motivates and encourages learners to learn numerous vocabulary. It has also proved to be an effective strategy for organizing the semantic field in the human brain (Aitchison, 1994). This could facilitate acquiring vocabulary because words are stored in learners' mental terminology clusters with related notions, not as a single item (Ebrahimi & Akbari, 2015). Fajrah (2019) argues that using the semantic relations techniques is needed as it clarifies the meaning of words by enabling learners to visualize the way they relate to each other. The connotations of words can only be recognized by examining and comparing their semantic associations with other words sharing the same context. Highlighting words fundamental for understanding texts and associating them with other words using sense relations help in making texts coherent and clarifying other unknown words.

III. LITERATURE REVIEW

Lexical knowledge is a great concern that attracts teachers' and researchers' attention as an essential component in language learning and a challenge most learners encounter (Crossley et al., 2009). James (1998) identified various types of lexical errors among which are semantic relation errors. A semantic field is a linguistic approach to the explanation of interrelations between vocabularies in specific categories (Sathientharadol, 2020). It has been applied in teaching and learning vocabulary by researchers across different levels of participants.

Reviewing the literature shows that the topic of semantic relations has been investigated from different aspects. Some research studies have concentrated on the level of awareness and the difficulties faced by English language learners. For example, Chen and Lai (2012) investigated EFL learners' responses to various metonymic and metaphoric expressions. The analysis of the data showed that EFL learners could distinguish between figurative and non-figurative sentences. They were even surer in judging metaphoric expressions than metonymic ones. Statements expressing emotions of anger were found easier to recognize. The findings implied that it would be advantageous to incorporate metonymy and metaphor in the curriculum to raise learners' awareness of figurative expressions. Saud (2018) examined the lexical errors committed by EFL students. The analysis of the data elicited via an achievement test assessed in light of Jame's (1998) taxonomy revealed 137 lexical errors categorised into formal and semantic. Formal mis-selection was the most frequent lexical formal error while mis-formation was the least frequent one. Confusion of sense relations was the most frequent among lexical semantic errors. The most problematic words learners faced were near-synonyms and the least problematic words were general terms for specific ones and overtly specific terms.

Some other research studies have focused on the impact of understanding semantic relations on improving EFL students' vocabulary mastery. For instance, Alameh (2018) found significant differences between the experimental and control groups revealing a positive effect of teaching semantic relations through blending task-based data-driven learning instruction and in-class instruction. Akbarian et al. (2020) investigated the impact of the different prompts in the lexical availability task and the different amounts of English exposure on learners' lexical availability output. The analysis of the data elicited by a lexical availability task and the new vocabulary levels test revealed both variables influenced on the number and quality of learners' word responses. A positive moderate correlation was found between the scores on the employed task and test and predicting learners' vocabulary level. Nataliya and Elena (2020) examined Russian EFL learners' degree of entrenchment of idiomatic knowledge encompassing synonymy, antonym, and polysemy. The ANOVA analysis of the data revealed significant differences in learners' knowledge of synonymy and polysemy compared to antonymy. In light of this result, some pedagogical implications regarding updating and revisiting educational materials and procedures were given.

Sathientharadol (2020) examined Prathomsuksa students' vocabulary proficiency after applying the semantic field instruction and their satisfaction with this teaching method. The results revealed that their vocabulary proficiency significantly improved due to teaching semantically related vocabulary. Besides, there were positive attitudes towards using this learning and teaching method. Liu and Wiener (2020) studied the way previously learned vocabulary might influence acquiring new words in L2. The results revealed recognizing and acquiring new words were facilitated by previously learned homophonous words, which in turn resulted in L2 lexical development.

Aydemir et al. (2021) examined EFL learners' level of awareness of semantic prosodic (SP) and its correlation with English proficiency levels. It also investigated learners' usage of semantic prosodic features and their ways of dealing with the associated challenges. Data collected through an open-ended questionnaire and a structured interview revealed that learners' SP knowledge correlated with language proficiency. However, little correlation was found between awareness levels and the student's proficiency. The researchers suggested that curricula designers should include content pertinent to the semantic prosody in syllabi to enhance students' ability to create semantically relevant sentences like their native counterparts. A recent study conducted by Alaee (2022) compared semantic network practices with the most traditional learning strategy EFL learners used. The analysis of the tests revealed that semantic network practices significantly influenced both the participants' depth and breadth of vocabulary knowledge compared to the commonly used ones.

The review shows that the aforementioned research studies have touched upon semantic relations in various contexts. Though they share a theoretical framework, there are differences in samples and teaching approaches. However, none of them has been conducted on Jordanian EFL learners through in-classroom teaching and self-learning. Thus, this study aims to bridge this research gap. It is also more comprehensive in the sense that it addresses the research idea from different points of view: the level of awareness, the impact of using semantic relations strategies on lexical availability output, and learners' attitudes towards it.

IV. METHODOLOGY

A. Sample of the Study

The random sample of the study consisted of 50 undergraduate EFL studying sharing a comparable social and educational background at a state university in Jordan. The purposive sample was 29 females and 21 males. Their age ranged from 20-21. They were majoring in English language and literature at a state university in Jordan.

B. Research Instruments

This study is a mixed methods research. The study followed an experimental approach: pre-and post-tests and an interview. This word association test consists of two parts: a newly devised list of frequently used words to which the participants are asked to write a related word that comes to their mind and a list of words that they should re-organize according to their relational sense. This casts light on the way vocabulary knowledge is structured in their mind. This type of test is considered and used by several researchers as a good technique for studying the cognitive structure and assessing proficiency in a foreign language (Bahar & Hansell, 2000; Wolter, 2002). Besides, it is effective and easy to administer, mark and analyze. It helps reveal great data about the process of retrieving words from students' long-term memory reflecting on the overlap of and the structure within and between words, thus assisting in measuring the semantic proximity of the input words. The interview helps in eliciting detailed data from the participants regarding their perceptions and attitudes about using strategy in learning and teaching vocabulary. Using numerous research instruments is considered a good research practice for exploring the topic from all feasible perspectives and triangulating results from more than one method to achieve sound findings (Mackey & Gass, 2005). Balram et al. (2003) argue that backing up quantitative results with qualitative ones can offer a robust resource to inform and crystallize the participants' perspectives and practices, thus achieving a good understanding of the issue under investigation. Validating the research instruments helps in achieving the objectives of the study besides attaining valid and reliable results. The test and the interview questions were examined by a jury of three English professors whose suggestions regarding the clarity of the test items and their relevance to the research objectives were taken into consideration. The

reliability of the findings was ensured by the great resemblance in the results of the co-analysis of the content of the participants' responses.

C. Data Collection and Analysis Procedures

Data were collected over an academic term. The participants all agreed to take part in the study after being aware of its objectives and the processes of the research. The participants first took a pre-test to determine their level of awareness of semantic relations, and then they were taught about semantic relations and how to use them to build semantic networks between unfamiliar words and already known words during the whole semester through diverse online and offline instruction and tasks aiming at enhancing students' lexical awareness and development. They were taught 3 hours every week in an advanced reading class. The principal researcher who was also the instructor played an important role as a facilitator to provide students with information about this technique and present some examples to them. The intervention was in the form of practicing each semantic relation technique over two weeks through various types of exercises. Students were also provided with extra exercises to practice at home. A post-test was then administered to the participants at the end of the term to determine the impact of this strategy on their vocabulary repertoire. They were then interviewed concerning their viewpoints on adopting this strategy for building a fortified vocabulary repository. The data were qualitatively and quantitatively analyzed. The data were analyzed using the ANOVA test to analyze the differences between the means of all semantic relations. The means and standard deviation scores were computed in order to determine the level of awareness of all semantic relations. Respondents with a mean of 2.4 or less were classified as less aware of the semantic relations, those with a mean of 2.4-3.4 as medium in their knowledge), and those with a mean of 3.5 and higher as most aware of the semantic relations. The pre-and post-test results were compared using a T-test to determine if there was a significant impact of using the semantic relations techniques on students' vocabulary knowledge and reading competency. The significant differences were rolled out based on the means and SD when the result was equal or less than ($p< .05$). In order to maintain data anonymity, the participants' real names were substituted with numbers. The data elicited via semi-structured interviews were analyzed thematically.

V. RESULTS AND DISCUSSION

A. To What Extent Are Jordanian EFL Learners Aware of the Semantic Relations?

The analysis of the data collected from the pre-test revealed the participants' low level of awareness of the semantic relations. It appeared that students faced difficulty recognizing the basic categories of semantic relations. As shown in Table 1, synonyms, antonyms and hyponyms were recognized more than other semantic relations with means of (4.80, 4.38 and 4.10) respectively. They recognized polysemy and heteronyms with means of (2.40 and 2.04). The least recognized categories of them were homonymy and metonyms with means of 1.96 and 1.56. The participants found metonymies the most confusing.

TABLE 1
THE DESCRIPTIVE STATISTICS OF THE PRE-TEST RESULTS OF THE MEAN AND STANDARD DEVIATION OF ALL SEMANTIC RELATIONS

	Mean	*N*	*Std. Deviation*	*Std. Error Mean*
Hyponyms	4.10	50	1.233	.174
Synonymys	4.80	50	1.161	.164
Antonyms	4.38	50	1.141	.161
Polysemy	2.40	50	1.229	.174
Heteronyms	2.04	50	1.309	.185
Homonyms	1.96	50	1.261	.178
Metonymies	1.56	50	1.402	.198

The findings indicate that Jordanian EFL learners are unaware of all semantic associations. Though they could identify synonyms, hyponymy and antonyms, they can not still provide various words sharing these semantic relations. Their responses are often based on one or two words that were synonyms or antonyms of the stimulus words maximum. This indicates that learners have little awareness of the significance of considering semantic relations techniques for grasping the meaning of unfamiliar words. This could be ascribed to the lack of clear-cut instruction of vocabulary as teachers mainly teach vocabulary based on a slight reference to vocabulary connotation in the process of teaching other courses focusing mainly on highlighting these two semantic relations only. Synonyms and antonyms are generally the most introduced and used semantic relations. The results could also be ascribed to the fact that vocabulary in in-class instruction is often limited or even neglected entirely by some teachers. It could also be because teaching vocabulary is not asserted in curricula and is left to teachers to manage themselves.

This result explains further learners' inability to vary their performance (both written and oral) and distinguish between the multiple senses of words. These findings are consistent with other researchers' findings who attributed this to the impact of lack of frequent exposure to vocabulary and their semantic relations. They found that the frequency effect is a robust predictor of L1 and L2 competency and the creation, fortification and processing of the associated linguistic patterns (Ellis, 2002; Arnon & Snider, 2010; Durrant & Schmitt, 2010; Lieven, 2008; Türker, 2016). The

result is also aligned with Alameh's (2018) finding that through providing fortified vocabulary semantic relations instruction, students' language skills should be developed and reinforced.

B. Is There a Significant Impact of Using the Semantic Relations Technique on Students' Vocabulary Knowledge and Reading Competency?

The analysis of the data collected through the post-test and compared with those of the pre-test reveals that there are significant differences between the learners' scores. This indicates that there is a positive correlation between using the semantic relations technique and students' vocabulary knowledge and reading competency. Table 2 demonstrates the T-test values with the degree of significance of each of the seven categories.

TABLE 2
THE MEANS, STANDARD DEVIATION AND DEGREE OF SIGNIFICANCE OF EACH OF THE SEVEN CATEGORIES

		Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*		*t*	*df*	*Sig. (2-tailed)*
					Lower	*Upper*			
1	Hypoynmy	3.660	1.944	.275	3.107	4.213	13.311	49	.000
2	Synonymy	4.000	1.654	.234	3.530	4.470	17.104	49	.000
3	Antonymy	4.120	1.734	.245	3.627	4.613	16.804	49	.000
4	Polysemy	5.100	2.043	.289	4.519	5.681	17.653	49	.000
5	Heteronyms	5.460	1.908	.270	4.918	6.002	20.233	49	.000
6	Homonymy	5.420	1.970	.279	4.860	5.980	19.454	49	.000
7	Metonyms	5.540	2.092	.296	4.945	6.135	18.727	49	.000

As demonstrated in the results, there is a positive correlation between using the semantic relations technique and students' vocabulary knowledge. This could be ascribed to the fact that adopting this technique helps learners establish a connection between different words including their meaning and usage. Besides, integrating this vocabulary learning and teaching method could always motivate language learners to create more connections between words they come across and those stored already in their minds, which ultimately results in vocabulary acquisition and linguistic competence. This demonstrates how remembering words becomes easier through hooking new words to the strain of the already stored joined words. This sounds logical since as Boers and Lindstromberg (2008) state semantic and structural elaboration operating in deep mental processes impact longer-lasting memory. This further implies that it is not significant how recently learners have learned words; rather what is of more significance is the depth of understanding and learning of the meanings of words through processing their semantic relations deeply.

The study demonstrates the effectiveness of using sense relations to educate them since all of the students passed the post exam and more significantly only very few of them had difficulty using terminologies correctly. The deep processing of semantically related words could consequently lead to better retention of their denotation, a deeper understanding of words' conceptual knowledge as well and memorizing new words quickly and effectively. Amer (2018) found learning semantic relations a powerful method that mimics the brain's way of organizing data as interrelated networked words rather than an unstructured list of words. Agust ń-Llach (2023) found the categorization of words a crucial cognitive activity that enables learners to make sense of the world and use new vocabulary to interpret reality. Agust ń-Llach (2023) has also revealed that learners store the concepts they recognize and acquire as members of taxonomic categories based on their internal properties and external relations with other vocabulary. This implies that the more efficient pedagogically teaching approach is the one that considers the psychological processes of semantic relatedness. This further entails providing learners with frequent encounters with the vocabulary being taught as it is essential for vocabulary acquisition and a high degree of learning. Such techniques would motivate the students, activate their schemata to compare and organize words and facilitate learning highly specialized words actively and independently.

Therefore, the more students establish a connection amongst words, the more their memory and brain stay active by relating, repeating and emphasizing them, which in turn results in great enhancement of vocabulary proficiency. This finding lends support to previous researchers' (Darussalam, 2022; Mousavi & Seifoori, 2022; Udaya, 2022; Agustín-Llach, 2023; Bengochea & Sembiante, 2023; Sukying, 2023; Rousoulioti & Seferiadou, 2023) findings which have proved that applying semantic relations has resulted in enhancing EFL /ESL learners' linguistic competency. Phuriudomseth (2010) recommends using the semantic field approach since it is effective for intermediate or highly proficient students and secondary and college students. The results are congruent with other researchers' findings (Yaghoubi & Seyyedi, 2017; Akbarian et al., 2020) that explicit teaching and learning of vocabulary approach influence the number and quality of learners' vocabulary knowledge.

C. What Are Jordanian EFL Learners' Attitudes Toward Using Semantic Relations Techniques in Vocabulary Learning and Instruction?

The analysis of the interview revealed that the participants perceive vocabulary learning as one of the major challenges they face in acquiring English as a foreign language. After being taught using semantic relation strategies, the students found such techniques good as they could help them become independent in learning EFL vocabulary. The results have revealed learners' positive attitudes toward using this technique in teaching and learning vocabulary for

many reasons. Almost 94% of the learners state that learning these strategies is fun as in *"I really enjoyed them all, they were amusing strategies that motivated me and enhanced the quality of the newly learned words".* They enjoyed the process of trying to find connections between words as in games. This implies that they motivate students and activate their minds to start acquiring as many vocabularies as they can. Besides, it appears that 96% of the interviewees felt that this technique creates a comfortable atmosphere inside the classroom. They felt that they were well-guided by their teachers and their mental ability to appropriately store and build fortified vocabulary repositories as in *"if my teacher used this great technique, I would feel being rightly guided by her to enrich our vocabulary knowledge and help succeed in learning English".*

Moreover, all learners indicated that this strategy should be adopted in the process of teaching vocabulary as it facilitates the process of recalling words once needed and remembering their denotations and connotations. This could be attributed to the fact that when learning vocabulary, mental links are made between semantic items in the mental lexicon which is believed to support vocabulary acquisition as argued by Roux (2013). This implies that generating such positive attitudes toward employing this method for teaching vocabulary would in turn result in yielding more positive attitudes and motivation towards acquiring languages as a participant says *"It cultivates our vocabulary knowledge that enhances our learning and language skills, this will be reflected in our enhanced education."* This would certainly accelerate and ease learning in general. Furthermore, learners refer their lack of good vocabulary knowledge to the fact that teachers often neglect explicit teaching of vocabulary using this technique and due to that, students also overlook this. This indicates their urgent need to implement this technique in the process of teaching vocabulary so as to encourage them to acquire new words.

It seems that the outcomes of the interview support the main results of the tests. A very interesting finding is that Jordanian EFL learners may ignore learning the semantic relations of the English lexicon if there is no explicit instruction of them. This indicates that implicit and explicit teaching of semantic relations among words should not be undervalued. Failure to notice any semantic relations between words may cause confusion and even impede reading, listening, writing and speaking. Students would find it easy to determine the meaning of words once they come across unfamiliar ones through calling their semantic relations. This finding lends support to other researchers' findings (Mehdi, 2008; Dwihastuti et al., 2022) that using semantic strategies could motivate and encourage students to learn the novel vocabulary. This is because mastering knowledge of words' semantic relations helps in determining their meanings as well. It is also in line with other researchers' findings (see Aydemir et al., 2021) which accentuate the importance of considering explicit vocabulary teaching. It could bring out subconscious relations in learners' mental word knowledge base that is continuously evolving through changing associations between concepts, adding new ones to the existing ones, thus having an expandable, deepened and strengthened vocabulary mental set.

The results indicate that there should be an effective didactic plan for developing a good storage system of vocabularies in learners' minds, which strongly fosters the teaching of coordinates depending on sense relations. They have implications for both implicit and explicit learning and their interactions. Teachers should have as their main goal developing students' awareness of semantic relations. This entails at first triggering an interest in students and developing their focus to consider learning and using vocabulary and semantic relations consciously. This in turn could help them develop a positive attitude toward learning and using vocabularies and improving their language skills. Developing a positive attitude could result in triggering an enduring interest in analyzing words meaning in various contexts and using them in diverse texts for a whole variety of purposes. This would certainly encourage learners to find their way of learning word meanings independently. Their mind will always stay challenged and activated once they come across new words trying to connect them to other stored words and apply this knowledge to real-life situations. This result supports Stahl and Nagys' (2006, vii) claim that "to have the desired impact, vocabulary instruction must not only teach words but also help students develop an interest in words".

The outcomes of the analysis have practical implications for those interested in material development, curricula design and language acquisition. They indicate that deliberate attention should be given to vocabulary instruction and in particular to explicit analysis of semantic relationships as a good teaching and learning strategy. This is because exploring semantic relations by other researchers could help provide more insights into the organization and development of EFL learners' mental lexicon. Teachers could benefit from such insights in designing semantic relation-based corpora to develop activities, tasks and tests. Using such well-developed corpora by teachers and learners is highly advocated.

VI. THE IMPLICATIONS OF THE STUDY

The study has many pedagogical implications. The researcher recommends teachers adopt a multi-semantic relations instructional strategy for generating a semantic relation-oriented model for acquiring vocabulary. Considering the fact that learners prefer vocabulary instruction, such intentional semantic relations teaching strategies could encourage and provide entertainment to learners and in turn help them accelerate their vocabulary growth and reading comprehension proficiency. Devoting sufficient time for teaching vocabulary may help teachers stimulate learners' minds through using the acquired semantic relations in a meaningful and productive way which may result in successful communication and producing perfect pieces of writing or even efficient analysis of literary pieces. The results could also give insights for curriculum and syllabus designers to concentrate on semantic relations as a good resource to develop an efficacious

vocabulary bank for language learners. Teacher-training programs should focus on highlighting the importance of using semantic relations as teaching techniques of vocabulary. The results are beneficial for those interested in computational linguistics as they encourage them to build advanced semantics-based models for teaching and making inferences about learners' vocabulary knowledge.

VII. CONCLUSION

The study examines Jordanian EFL learners' awareness of semantic relations encompassing synonymy, antonymy, polysemy, homonymy, metonyms and hyponymy. The results of the ANOVA test have revealed that Jordanian EFL learners face certain difficulties concerning the identification and production of all semantic relations. The T-test analysis revealed that the degree of awareness of the major types of semantic relations has significantly enhanced thanks to this strategy. The findings reveal that learning vocabulary is reinforced significantly through teaching semantic relations strategies. The learners also showed positive attitudes towards using this technique asserting that it has contributed to their mental lexicon. Further replication of the study with a huge sample integrating various educational levels is recommended. The current study is also limited to using semantic relations as powerful techniques to enrich learners' vocabulary knowledge, thus future studies should investigate the impact of other techniques such as contextual clues on vocabulary development and overall language proficiency. More comparative studies are needed to provide valuable insights into how language learners develop deep lexical knowledge.

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