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## An Exploration of English Language Education Technology Incorporating Vocabulary Teaching Strategies

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### Abstract

*Starting from the connotation of vocabulary learning strategies, this paper explains the four stages of vocabulary, i.e., the presentation stage, the linkage stage, the application stage, and the testing stage, combined with teaching examples. It proposes to build a vocabulary network, mobilize students' motivation and participation in learning, build a framework for improving English educational technology by combining deep learning strategies, innovate the content and mode of English educational technology, and strengthen the integration of teaching with vocabulary teaching strategies. Students in the experimental class and the control class were tested on the four dimensions of vocabulary sound, shape, meaning and utilization, and the average score of the control group in the comprehensive utilization was the highest at 38.6. Therefore, the integration of vocabulary teaching strategies in English educational technology can further promote the transformation of English vocabulary teaching and learning styles.*

**Keywords:** *vocabulary teaching strategies; English educational technology; deep learning strategies; vocabulary network; teaching examples*

### Introduction

In recent years, the importance of vocabulary in English language teaching has been increasingly recognized by linguists and educators (Zhang, Li, Jiao, Ma, & Guan, 2016). As one of the three elements of language, vocabulary is an important part of language. As far as English education technology is concerned, the size of vocabulary fundamentally determines whether readers can understand the content of the materials they read, so many scholars believe that learners' vocabulary is the determining factor for the level of their reading ability (Manyak & Latka, 2020). The role of vocabulary in English education determines the importance of vocabulary teaching, and the purpose of English language teaching is to guide students to communicate and socialize with the knowledge they have acquired (Gibson, 2016).

The cultivation and improvement of such communication and sociability depend on the improvement of students' language proficiency, which in turn depends on the increase of vocabulary (Suresh, Sameer, & Susan, 2022). Language teachers, first of all, should have a comprehensive understanding of vocabulary knowledge and a correct understanding of vocabulary teaching, so that they can adopt correct teaching strategies to help students effectively master and accurately use vocabulary in practice (Sistani & Hashemian, 2016).

Although vocabulary teaching is easy to say, it is not a simple task to make vocabulary teaching effective. The traditional English vocabulary teaching is to impart English language skills or test-taking skills to students, but with the continuous progress of society and the continuous reform of education, relevant researchers have put forward the concept of core literacy and advocated the integration of vocabulary teaching strategies into English educational technology to effectively improve students' ability to apply vocabulary (Okyar, 2021). In the process of integrating vocabulary teaching in English education technology,

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high importance is attached to the innovation of vocabulary teaching ideas, and in the specific teaching process, the past practice of teachers' requirements and students' memorization is changed, and the cultivation of students' English literacy is taken as the goal of vocabulary teaching (Andalis, Henson, Junsay, Makan, & Cruz, 2017). Under the guidance of such a goal, carrying out vocabulary teaching will step into a new stage, so that students are actively involved in vocabulary learning. Under the correct guidance of teachers, the vocabulary mastered by students will be greatly enriched, and students can learn to use vocabulary (STAECK, OTTONI, & SCHINDLER, 2022).

A quantitative study was conducted in the literature (Abdul Rahman & Nasri, 2020) to investigate what role vocabulary learning strategies play in helping language learners develop their language learning. Data were collected from a number of learners from three faculties of a university, and descriptive analysis and one-way ANOVA with post hoc tests were used. The results showed that note-taking, memorization and guessing using linguistic cues were the three most preferred strategies by the students, and the results provide some insights into the teaching and learning process (Bzinkowski, Ryba, Siemiakowski, & Rucki, 2022).

Literature (Daud, Kazi, & Kalsoom, 2019) assessed the effectiveness of building vocabulary for elementary school students through read-aloud strategies and also to determine the impact of read-aloud strategies on overall vocabulary development of students at the elementary level. A quasi-experimental design was employed using non-randomized sampling method where two already existing intact groups were assigned as experimental and control groups respectively. The results indicated that reading aloud is the most appropriate instructional strategy for vocabulary building. The literature (Rousoulioti & Mouti, 2016) explored whether vocabulary learning strategies are a subcategory of language learning strategies. Vocabulary learning strategies used by adult learners of Greek as a second language to deal with unknown vocabulary in second language reading were studied. The results showed that the context and the general knowledge about the subject matter brought by the second or foreign language learner, mainly supported by other words in the sentence, play the most important role in understanding the vocabulary (Comar, Hegazy, Henderson, & Hrozencik, 2014).

Literature (Asyiah, 2017) tested the role of vocabulary in foreign language learning and explored teachers' and students' perceptions of vocabulary teaching and learning. A mixed-method design was used to survey English teachers and a number of students, and the results showed that both teachers and students had positive attitudes towards vocabulary teaching and learning. Literature (Khamitova, Mukhtarkhanova, & Zarkesheva, 2019) illustrates that vocabulary is particularly important in the English for Specialized Purposes program and presents the results of a study of vocabulary teaching and learning strategies used by teachers and learners, at a university in Kazakhstan. Open-ended questionnaires and semi-structured interviews were conducted with 20 teachers and 48 students at L.N. Gumilyov Eurasian National University.

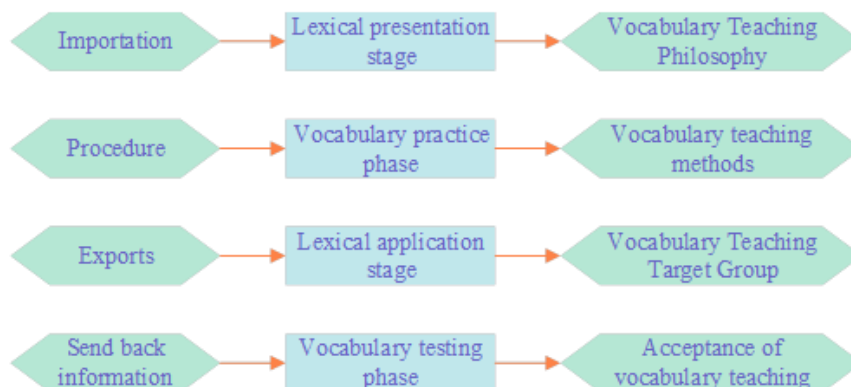
During the interviews, students described their preferred ways of learning vocabulary and affirmed the importance of learning vocabulary in teaching. The study identified the most effective vocabulary teaching and learning strategies for university teachers. Literature (Baskin, Iscan, Karagoz, & Birol, 2017) examined vocabulary learning as a basis for language learning in the process of teaching Turkish as a second language. A general screening model was used to determine the vocabulary learning strategies of the students at the Turkish Language Teaching and Application Center of Osmanpazar University in Gazi. The questionnaire was based on Schmidt's Taxonomy and categorized vocabulary learning strategies into two categories. The results of the study showed that students' language level is effective in determining vocabulary use. Literature (Tokar & Fainman, 2019) explored the vocabulary content of an English language teaching program for aviation students in order to expand their English vocabulary. Current vocabulary teaching strategies were discussed to provide an instructional approach to learning aviation vocabulary items in an intentional and planned manner. The results indicate that mastery of a word implies a complete understanding of its meaning, usage, and ability to connect it to other words in a sentence, and that regular and intentional vocabulary practice is important after vocabulary is introduced to students. Literature (Wan, 2022) shows that vocabulary is the foundation of English learning and that mastering a certain amount of vocabulary is necessary to improve primary school students' ability to listen, speak, read and write. With the revolution of educational concepts and the reform of the new curriculum, many new teaching methods have emerged and been applied to the English classroom, and scaffolding teaching shows its strong applicability in this particular teaching field. The theoretical basis of scaffolding teaching is introduced, and the steps and characteristics of scaffolding teaching, which puts students at the center of the classroom, are discussed.

Using the literature research method, some applicable strategies for teaching vocabulary based on scaffolding are proposed.

This paper constructs a model of English education integration vocabulary teaching strategy, which consists of four stages: input, process, output and feedback. It introduces the concept of English vocabulary and the basic content of vocabulary teaching, and explores the strategy of English vocabulary teaching by integrating English education technology, i.e., constructing a complete knowledge system of English vocabulary and guiding students to carry out the categorized learning of vocabulary. It creates problem-oriented and inspiring teaching situations of English vocabulary, strengthens the integration teaching of vocabulary parts of speech, and focuses on the teaching of English vocabulary in cultural contexts to improve students' language communication ability, literacy ability. The results show that through the application of vocabulary teaching strategies integrated into English education technology, the English teaching content can be effectively accomplished and the expected teaching goals can be realized. Therefore, strengthening the use of vocabulary in English teaching can effectively improve the quality and efficiency of teaching.

### Integrating Vocabulary Teaching Strategies in English Language Teaching

Vocabulary, as the foundation of language learning, is closely related to grammar, phrases, sentence patterns and so on. Integrating vocabulary teaching strategies in English teaching, teachers should focus on the dual attributes of English vocabulary's instrumental and humanistic nature, and make integration and categorization of difficult vocabulary, grammar, and sentence patterns (Chai, Ayres, & Vail, 2016; Saleh & Ahmed Althaqafi, 2022). Focusing on the education and teaching of vocabulary pronunciation, morphology and meaning, students are guided to strengthen the oral expression and application of words and sentences in order to improve the efficiency of vocabulary teaching and the quality of students' learning. Figure 1 shows the model of English education integration vocabulary teaching strategy, which consists of input, process, output and feedback, and the basic process of English vocabulary teaching educational technology, i.e., the four phases of presentation, practicing, application and testing. Learners need to input content related to the target vocabulary, and strategies such as vocabulary layering, vocabulary association, vocabulary matching, contextual word guessing, and cultural introduction are used to present the target vocabulary to the learners, taking into account the cognitive characteristics of the English learners (Ilyas, 2017). Provide learners with the relevant content they need to master and learn about their own learning effects in time through the feedback stage. Teachers will use strategies such as mind mapping, vocabulary substitution, vocabulary depth measurement, and core vocabulary communication to design appropriate tests to strengthen the ELA technology (Sun, 2014). Learners can reflect on whether they have achieved the expected goals through the tests in time to strengthen their learning motivation. Vocabulary is a prerequisite for students to learn English, and students cannot improve their English performance if they do not have enough vocabulary (Rossiter, Abbott, & Kushnir, 2016). With the continuous reform of English education, schools gradually pay attention to English teaching, so they need to focus on vocabulary courses to improve students' vocabulary (Stanojević & Petrović, 2020). However, at this stage, there are still many deficiencies in English vocabulary teaching, in order to change the status quo of vocabulary course teaching, the school must change the teaching method, the knowledge of constructivism theory is fully integrated with the teaching, to promote the development of English education technology, and to improve the vocabulary of students.



**Figure 1:** Model of integration of ELA and vocabulary teaching strategies

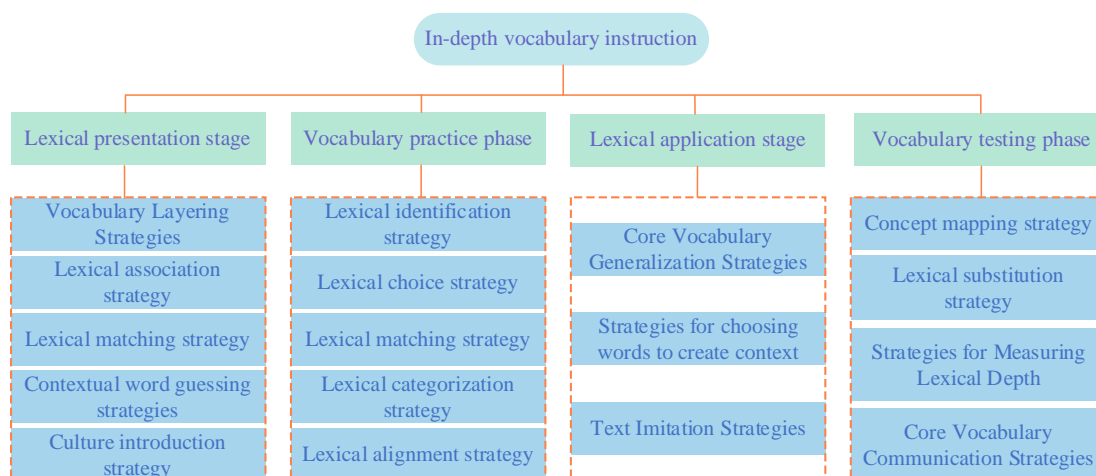
## EFL strategies incorporating deep learning

### English Vocabulary Teaching under Deep Learning Theory

Deep learning refers to a meaningful learning process in which students actively participate, experience success and develop wholeheartedly around a challenging learning topic under the leadership of the teacher. Based on the concept of deep learning, this paper explores English education technology with vocabulary teaching strategies. According to the connotation of deep learning theory, the main features of deep learning include the integration, optimization and reconstruction of knowledge, the initiative and participation of learning and social and cultural participation. Figure 2 shows the flow chart of the implementation of English vocabulary teaching strategies under the deep learning theory, which incorporates the deep learning theory in the four stages of vocabulary teaching: presentation, connection, application and testing. The rationality of integrating deep learning theory and English vocabulary education technology is manifested in the aspects of promoting the construction of vocabulary networks and mobilizing learners' motivation and participation.

First of all, to promote the construction of vocabulary network, teachers should use learners' previous vocabulary as a means of introducing new vocabulary when teaching vocabulary in the classroom, and guide them to integrate and optimize the old knowledge with the existing knowledge through the vocabulary presentation, practice, application, and testing phases. It promotes learners' understanding of new knowledge and review of old knowledge to find the substantial connection between old and new knowledge, so as to reconstruct a new vocabulary network. Then, mobilize learners' enthusiasm and participation. Deep vocabulary learning focuses on learner-centeredness, and the deeper the learning, the deeper the learner's involvement (Malik, Mahmud, Anshari, & Salija, 2020; Miranda, Bettio, & Schmidt, 2021). Teachers can inspire learners to apply vocabulary knowledge to different situations by setting different depths of tasks in vocabulary teaching to promote problem solving, so as to make them feel the joy of success in vocabulary learning and enhance their self-efficacy and learning motivation.

In specific teaching practice, we should adopt effective teaching methods according to the teaching principles, and at the same time, we should mobilize students' motivation and cultivate their interest in learning English, from willingness to learning to enjoy learning. Teachers should also play their roles of transferring knowledge, guiding methods and supervising and evaluating in vocabulary teaching, so that students can learn vocabulary well and develop good English learning habits, laying a good foundation for future English learning (Perec, 2022).

**Figure 2:** Flow chart of the implementation of English vocabulary teaching

### Framework for Technology Enhancement in English Language Education

In the field of teaching, the connotation of teaching strategies has a broad and narrow sense, and at present, vocabulary teaching has developed into a central part of foreign language teaching. Combined with deep

learning, vocabulary teaching strategies are applied to students' daily education and learning, and it is found that teaching strategies can be effective in enhancing students' vocabulary learning ability (Dong & Lin, 2017). Figure 3 shows the framework of English education technology enhancement after integrating vocabulary teaching strategies. In the traditional English teaching process, teachers directly instill knowledge into students, which does not work well. Teachers should design and build a reasonable teaching situation according to the students' learning stage and mastered knowledge as a reference condition, organize and carry out a variety of vocabulary teaching activities, and gradually guide students to absorb and transform their vocabulary knowledge.

Under the guidance of constructivist teaching theory and with the guidance and help of teachers, all students will become the main participants in vocabulary teaching activities. Instead of teaching vocabulary by instilling knowledge, the teacher encourages students to actively explore and cultivate their ability to construct knowledge on their own. In the process of teacher-student interaction, students' interest in vocabulary learning is constantly stimulated, students are helped to recognize the sound, shape and meaning of words, and students are guided to take the initiative to learn and improve their own vocabulary system, so that the effect of vocabulary teaching can be gradually improved.

Vocabulary teaching is an important part of English education, and to neglect vocabulary teaching is to neglect the essence of language teaching. In English vocabulary teaching, teachers should uphold the idea that there is no definite method of teaching, but the most important thing is to get the right method, constantly improve teaching methods, and cultivate students' observation, memory, thinking, imagination and creativity. In the development of English education technology, teachers can only improve the efficiency of vocabulary teaching and achieve the teaching purpose by emphasizing teaching strategies and adopting effective teaching methods.

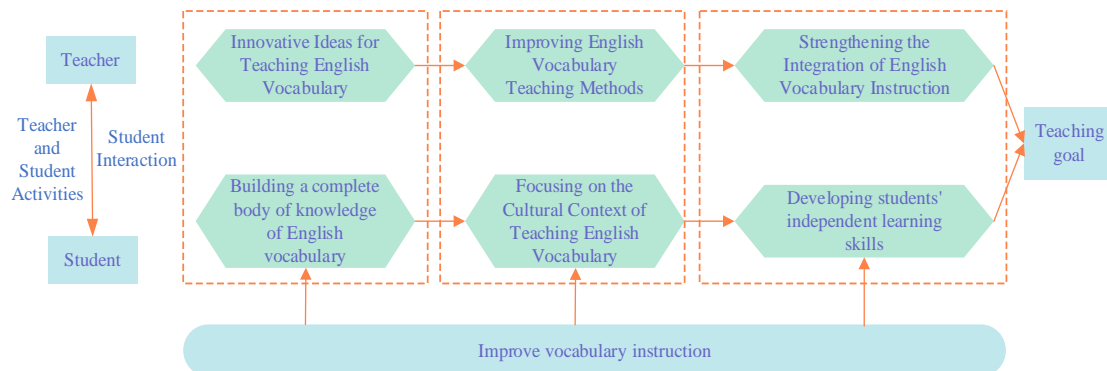


Figure 1: Framework for Technology Enhancement in English Language Education

## Analysis of English Language Education Technology Integrating Vocabulary Teaching Strategies

### Analysis of EFL pre-test scores

In this paper, a controlled experiment was conducted to verify the effectiveness of vocabulary teaching strategies in the practice of English language teaching. One of the classes was a controlled experimental class, which was taught English vocabulary using the cooperative group learning method, with the exception of the teaching method which was the same as that used in the control class. The other class was a traditional class in which English vocabulary was taught using conventional methods. A uniform test was administered to the experimental and control classes.

Table 1 shows the analysis of the pre-test scores of the experimental and control classes. According to the pre-test scores of the control experimental class and the conventional teaching class, the average score of the experimental class was 78.4 and the average score of the control class was 81.4, and the difference between the two classes' average scores was 3 points. Although foreign language vocabulary, as common memory material, can be consolidated through reasonable review cycles and mnemonics, learners must improve the depth of their vocabulary knowledge if they want to maintain long-lasting vocabulary memory and internalize it in their minds. This requires learners to use vocabulary in specific contexts, closely related



to the process of learning and using, learning together and using together, so that learning forms a dynamic system.

**Table 1:** Analysis of pre-test scores of experimental and control classes

Classes or grades in school	Number of people	Average value	Standard deviation	Standard Error Mean
Experimental class	48	78.4131	15.32417	2.94513
Control subjects	51	81.4166	14.87632	2.98652

In order to test the difference between the two classes' scores even further, an independent samples T-test was performed on the pre-test scores of the two classes. Table 2 shows the independent sample T-test for the pre-test scores of the experimental class and the control class, and the significance of the test = 0.523, with two-tailed significance significantly greater than 0.05. It can be seen that the experimental class and the control class have less variability in their scores, and that the two classes are at the same level of English proficiency, which is clearly comparable and allows them to participate in the vocabulary teaching strategies. In English classroom teaching, the collocational relationship between words is the focus of vocabulary teaching, which plays an important role in improving students' test-taking ability, especially in improving the comprehensive ability of the fourth and sixth grade exams. Teachers should teach students what kind of structures the key vocabulary words are used in conjunction with, such as verb infinitives, gerunds, subordinate clauses or prepositional phrases, and whether the meanings change after they are used in conjunction. English teachers should have a clear understanding of each student's psychological developmental characteristics and the student's cognitive level, and they should know that each student's ability to learn and speed of learning is different, so they cannot use a one-size-fits-all teaching approach. In order to solve this problem, and in order to promote the establishment of cooperative learning relationships between students, under the premise of ensuring the efficiency of the classroom, teachers can cultivate students to carry out exploratory cooperation, in this process, teachers should play a good role as a guide and collaborator. In the class with the principle of fairness and impartiality, after the students elected the leader and vice leader of each group, the teacher should actively encourage students to group collaboration, the establishment of mutual cooperation, mutual help learning group, cultivate students' independent learning ability.

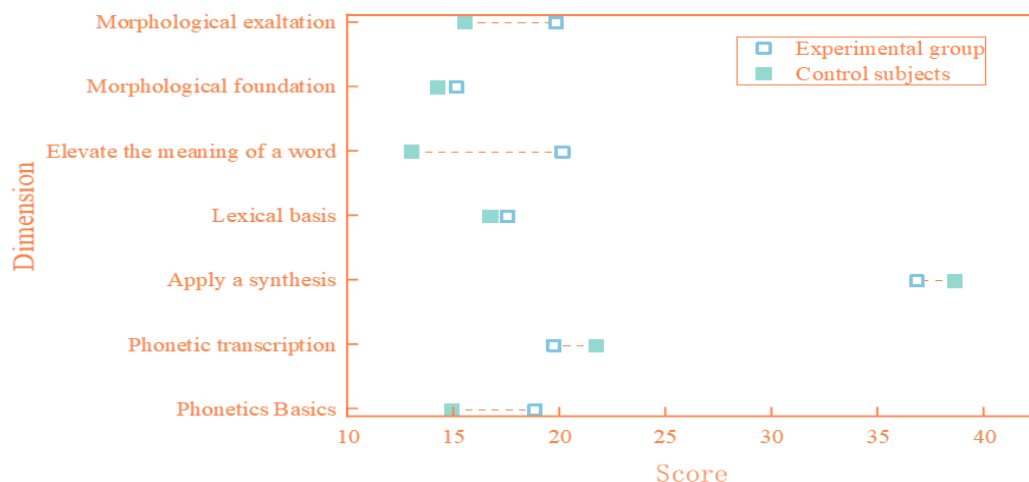
**Table 2:** Independent sample t-test for pre-test scores of experimental and control classes

		Levene's variance equivalence test		Mean equivalence t-test							
		F	Significance	T	Degrees of freedom	Statistically significant	Mean difference	Standard error	Difference 95% confidence interval		
									Lower limit	Limit	
<b>Pre-test score</b>	Assuming equal variance	.207	.523	-.07	82	.880	-1.897	4.23204	-	7.35871	5.87041
	Not assuming equal variance			-.07	79.8	.880	-1.897	4.23346	-738756		5.85035

### Descriptive Statistical Analysis of English Vocabulary Education

The experimental and control classes were tested on the four dimensions of vocabulary sound, shape, meaning, and use, with the same test questions for both classes, and each dimension was divided into two levels: basic and advanced. In order to minimize the effect of students' intentional attention on the implementation results, the instruction was implemented as a whole class rather than individually for the screened subjects. Figure 4 shows a comparison of the average scores of the two groups on the dimension's test, and it can be seen that the highest average score was found in the use of synthesis, with the control group reaching 38.6, and that the control group outperformed the experimental group in vocabulary-phonics pull-out and use of synthesis. After analyzing the results, it was found that the phenomenon of vocabulary-phonics enhancement was due to the fact that the experimental group, who was exposed to the

teaching method in the English teaching environment of integrating vocabulary teaching strategies for the first time, was more excited in class, which affected classroom discipline and the effect of phonics teaching. The main reason why the control group was higher than the experimental group in terms of utilization was that it was the first time for the experimental group to be exposed to this educational technology environment, and the students were not yet familiar with the operation of the English educational technology and the rules of classroom activities in the integration of vocabulary teaching strategies. The result was that the rhythm of the classroom was affected and the use of the practice activities was affected.



**Figure 4:** Comparison of average scores of the two groups of dimension tests

In order to verify the effect of the use of English educational technology on subjects' receptive and productive language levels after integrating vocabulary teaching strategies, both the experimental group and the control group participated in the English monthly examination test after a three-month teaching experiment intervention to find out whether the receptive and productive language levels of the two groups were still the same. Table 3 shows the post-test descriptive statistics of the experimental and control groups' receptive and output scores in the English monthly test. Based on the data in the table, it can be seen that the average receptive scores of the experimental and control groups in the English monthly test were 51.86 and 44.78. The mean score of the experimental group is higher than that of the control group by 7.08 points, in addition, the standard deviation of the experimental group and the control group is 11.287 and 13.255. The standard deviation of the experimental group is lower than that of the control group, which indicates that the degree of dispersion of English receptive scores of the experimental group is lower than that of the control group, i.e., the degree of bifurcation of the experimental group's subjects is lower. Therefore, in the actual teaching process, teachers should consciously cultivate students to infer and guess the meanings of vocabulary words in reading materials according to the context of the discourse, i.e., the logical relationship between words, phrases, sentences, and the preceding and following parts of speech. Vocabulary words in the teaching materials are not impossible to follow, but their meanings are closely related to the meanings of other words in the context of the sentence or the specific context. In the process of teaching, the meanings of many vocabulary words can be deduced by making full use of the relevant words and phrases in the context, combined with the specific context.

**Table 3:** Descriptive statistics of English monthly exams of the two groups

	Groups	Number of cases	Average value	Standard deviation	Standard Error Mean
<b>Acceptability scores</b>	Experimental group	48	51.86	11.287	1.717
	Control subjects	51	44.78	13.255	1.874
<b>Output accomplishments</b>	Experimental group	48	7.563	6.451	0.923
	Control subjects	51	6.874	6.121	0.920

In order to further investigate whether there is a significant difference between the vocabulary acquisition effect of the research subjects in the experimental group and the control group, the scores of the English vocabulary test paper of the two groups in each question type were analyzed for data. Table 4 shows the descriptive statistics of each question type of vocabulary in the experimental and control groups, in which the average scores of spelling accuracy, meaning comprehension accuracy, grammatical accuracy and

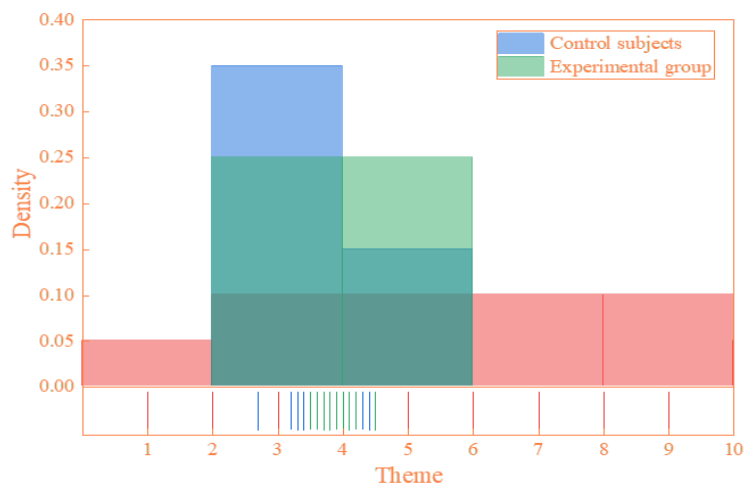
application appropriateness in the experimental group were 6.125, 13.340, 3.074 and 2.600 respectively. The corresponding mean scores of the four question types in the control group were 6.075, 13.121, 3.246 and 2.974, indicating that the mean scores of each question type of the English Vocabulary pre-test in the experimental group and the control group were extremely close to each other, with small differences. In the process of English teaching, helping students to effectively integrate vocabulary teaching strategies is not only conducive to their grasping the direction of learning, adopting a scientific approach, and improving learning efficiency. It also helps them to form the ability of independent learning and lay the foundation for lifelong sustainable learning.

**Table 4:** Descriptive statistics of vocabulary in the experimental and control groups

	Groups	Number of cases	Average value	Standard deviation	Standard Error Mean
<b>Typographical</b>	Experimental group	48	6.125	7.211	1.251
<b>Accuracy</b>	Control subjects	51	6.075	6.134	1.210
<b>Sense</b>	Experimental group	48	13.340	5.877	1.101
<b>Accuracy</b>	Control subjects	51	13.121	6.451	1.331
<b>Grammatical</b>	Experimental group	48	3.074	4.560	0.912
<b>Accuracy</b>	Control subjects	51	3.246	4.311	0.915
<b>Appliance</b>	Experimental group	48	2.600	2.866	0.576
<b>Appropriateness</b>	Control subjects	51	2.974	2.115	0.455

#### Analysis of students' interest in English education

In order to detect the role of English educational technology on students' English vocabulary learning interest aspect after the integration of vocabulary teaching strategies proposed in this paper, the data were compared between the two groups of students, with strongly disagree as 1, relatively disagree as 2, indifferent as 3, relatively agree as 4, and strongly agree as 5 representing the highest interest. Figure 5 shows the comparison of students' learning interest scores, in addition to topic 8 control group scored 4.4 higher than the experimental group 4.2, the rest of the nine topics experimental group scores are greater than the control group, topic 5 experimental group scored the highest 4.5. English education technology to integrate the cultivation of vocabulary teaching strategies, we need to optimize the content of vocabulary teaching and innovate the form of reading teaching. In this process gradually cultivate students' interest in English reading and learning, and form correct and good English reading learning habits. The cultivation of core literacy is implicitly integrated into teachers' daily English vocabulary teaching and students' independent learning, laying the foundation for students' future development.



**Figure 5:** Comparison of students' interest in learning scores



## Discussion

Integrating Vocabulary Instructional Strategies in English Language Education Technology is promising. By utilizing innovative technology tools and pedagogical approaches, educators can create dynamic and interactive learning environments that cater to a variety of learning styles and preferences. This integration allows for personalized vocabulary learning, allowing learners to resonate with the material in the most effective way. In addition, the incorporation of multimedia resources has the potential to significantly improve vocabulary retention and comprehension. Additionally, data analytics and AI-driven assessment tools provide educators with valuable information about individual learner progress, allowing for targeted interventions and tailored feedback. As technology continues to evolve, immersive language learning experiences that incorporate virtual language labs and real-time communication platforms open up exciting avenues for both educators and learners. The future of English language education technology lies in the ability to seamlessly integrate vocabulary teaching strategies with cutting-edge technological advances, ultimately revolutionizing the way language is learned and mastered.

## Conclusion

This paper combines the concept of deep learning and adopts the method of controlled experiment to verify the effect of English educational technology in actual teaching after integrating vocabulary teaching strategies. Based on this, a series of effective teaching strategies are proposed to provide an opportunity to improve students' independent learning ability. The pre-test scores of the experimental and control classes were tested, and the average score of the experimental class was 78.4 and the average score of the control class was 81.4, with a difference of 3 points between the average scores of the two classes. Descriptive statistics on the posttest of the experimental and control groups' receptive and output scores in the English monthly examination test showed that the average receptive scores of the experimental and control groups in the English monthly examination test were 51.86 and 44.78, and the average score of the experimental group was higher than that of the control group by 7.08 points. Therefore, in the teaching practice of English educational technology, by integrating vocabulary teaching strategies, the vocabulary learning effect of students was improved and the number of English vocabulary of students was enlarged. It makes the students' reading comprehension ability improved to some extent, and also makes the students' overall English scores improved accordingly.

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