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Exploration on the Teaching Strategy of English Speculative Reading in Colleges and Universities Based on Mobile Auxiliary Platform

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Abstract: The rapid advancement of information technology has profoundly transformed daily life, with new technologies and pedagogical methods increasingly incorporated into educational practice. Leveraging modern information technology to integrate subject content is critical for improving teaching effectiveness and quality. Against the background of educational informatization, smart teaching and mobile-assisted teaching platforms have witnessed continuous development. As an important technical tool, mobile-assisted platforms facilitate educational advancement and support deep integration between information technology and subject teaching. Prior studies have confirmed that mobile teaching platforms can improve student engagement and tackle practical classroom challenges. Based on the characteristics of college English reading, this paper constructs a mobile-platform-supported teaching model for university English reading and carries out lesson design as well as experimental teaching to investigate the model's impacts on students' reading performance. According to experimental data, after a two-month teaching intervention using the mobile-assisted platform, the average reading score of the experimental class increased from 32.83 to 37.48, representing a gain of 4.65 points.

1. Introduction

English speculative reading is an indispensable part of college English quality education and a core carrier for cultivating students' critical thinking and comprehensive language application competence. Different from basic reading that focuses on information acquisition and knowledge memorization, speculative reading emphasizes deep text interpretation, logical reasoning, viewpoint discrimination and rational evaluation, which puts forward higher requirements for students' independent thinking and analytical ability. Nevertheless, restricted by the traditional exam-oriented teaching mode, current college English reading teaching still has prominent deficiencies. Most teachers focus on vocabulary explanation, sentence analysis and text content interpretation, while ignoring the systematic training of students' speculative thinking. Long-term passive reading learning makes students accustomed to accepting fixed text viewpoints, resulting in weak critical

awareness, single reading thinking and insufficient ability of independent text evaluation, which seriously restricts the improvement of college students' comprehensive English literacy.

With the continuous advancement of information technology and the popularization of mobile intelligent terminals, mobile educational platforms have been widely applied in college classroom teaching[1]. Breaking the limitations of time and space in traditional teaching, mobile auxiliary platforms integrate massive open reading resources, real-time teacher-student interaction functions and whole-process learning data recording systems, which provide diversified scene support and personalized learning conditions for the reform of speculative reading teaching[2]. Relying on mobile platforms, teachers can design hierarchical and targeted speculative learning tasks, realize student-centered interactive teaching, and effectively stimulate students' initiative in critical thinking[3]. Therefore, exploring the application strategies of mobile auxiliary platforms in college English speculative reading teaching is of great practical significance for optimizing reading teaching modes and improving students' critical reading competence.

At present, domestic and foreign scholars have carried out extensive research on English reading teaching and mobile-assisted teaching. In terms of reading teaching research, most studies focus on the application of activity-based teaching, task-based teaching and multimedia teaching in basic reading training, which can effectively improve students' basic reading skills and classroom participation. However, existing studies pay insufficient attention to the cultivation of speculative thinking, and lack targeted teaching design for critical reading ability[4]. In the field of mobile-assisted foreign language teaching, relevant studies have verified that mobile platforms can optimize teaching scenarios, enrich learning resources and realize personalized teaching, which creates favorable conditions for innovative foreign language teaching[5]. Nevertheless, most existing researches focus on general English teaching, and few studies systematically explore the whole-process teaching design and empirical effect of mobile platforms applied to college English speculative reading teaching, forming a certain research gap[6].

In view of the above research deficiencies and practical teaching dilemmas, this study constructs a complete set of mobile platform-based speculative reading teaching system, optimizes teaching links from pre-class, in-class and after-class dimensions, and builds a diversified mixed evaluation mechanism. Through controlled teaching experiments and questionnaire surveys, this study systematically verifies the practical effect of the innovative teaching model, aiming to provide practical optimization schemes and empirical data support for the innovative reform of college English speculative reading teaching.

2. Teaching Design of English Speculative Reading in Colleges and Universities

This study intends to integrate mobile terminal technology into college English speculative reading teaching to remedy the drawbacks of traditional reading instruction. To foster students' enthusiasm for in-depth reading and critical thinking, modern educational technology is adopted to innovate traditional teaching modes and connect textbook knowledge with real-life contexts. In this student-centered teaching model, teachers act as teaching guides and facilitators to organize and optimize learning activities. The teaching objectives focus not only on the cultivation of basic reading skills and information generalization competence, but also on the long-term development of students' independent speculative and analytical abilities. By adapting teaching strategies to mobile learning resources and intelligent teaching environments, this study constructs a mobile-assisted teaching model that integrates the disciplinary characteristics of college English with the interactive advantages of mobile platforms, so as to realize the systematic cultivation of students' speculative reading competence.

2.1 Preliminary Analysis

To ensure the rationality and practical feasibility of the mobile-assisted speculative reading teaching design, this section conducts a comprehensive preliminary investigation and analysis covering four essential teaching dimensions: learner characteristics, teaching content arrangement, instructional objective setting, and mobile teaching environment construction. The analytical results provide solid theoretical and practical foundations for the subsequent formulation and implementation of the whole-process teaching model.

The research participants of this study are college undergraduates, who are undergoing a critical cognitive shift from concrete thinking modes to abstract logical thinking modes. After years of consistent English learning, college students have acquired basic reading skills and preliminary text comprehension abilities, with their overall reading cognition steadily improved. However, traditional reading teaching predominantly focuses on literal knowledge explanation, lacking systematic training in abstract logical reasoning and critical judgment, which leads to the general weakness in students' speculative reading capacity. In contrast, mobile auxiliary teaching platforms provide multi-dimensional learning resources and interactive functional support, enabling students to interpret reading materials from diverse perspectives, integrate newly acquired knowledge with existing cognitive experience, and promote the development of abstract thinking and independent analytical competence through active knowledge reconstruction.

The mobile-assisted speculative reading teaching system adopts a three-stage progressive teaching framework consisting of pre-class preparation, in-class interaction and after-class expansion. Pre-class learning tasks are designed to stimulate students' internal reading motivation through independent material browsing and pre-learning reflection, helping learners eliminate basic vocabulary and comprehension obstacles and develop clear learning questions before formal classroom learning. In-class teaching links focus on designing hierarchical and diversified learning tasks to cultivate students' logical reading methods and speculative analytical skills. The after-class teaching stage emphasizes knowledge expansion and practical ability application, guiding students to conduct extended reading training based on the thematic connotation and logical correlation of reading texts so as to realize the long-term internalization and transfer of speculative reading competence[7].

Instructional objectives serve as the fundamental guideline for organizing the entire teaching procedure and dominate the orientation of all teaching activities. In the mobile-driven speculative reading teaching context, the formulation of teaching objectives must conform to the curriculum standards and talent cultivation requirements of college English education. Combined with the cognitive features and learning foundations of college students, this teaching design prioritizes the long-term cultivation of sustainable speculative reading competence rather than short-term knowledge accumulation. Since English speculative reading ability requires continuous accumulation and long-term training, this study establishes phased and hierarchical teaching goals to progressively enhance students' capabilities in text analysis, logical reasoning and independent critical evaluation.

The mobile auxiliary teaching system is structurally composed of three major functional modules: student terminal, teacher terminal and network server terminal, which jointly support the intelligent operation of speculative reading teaching activities. The student terminal integrates diversified interactive instructional functions including real-time classroom interaction, screen sharing and online commenting, together with personalized learning tools such as customized teaching plans, targeted reading tasks, electronic reading resources and micro-course resources to meet students' differentiated autonomous learning demands. The teacher terminal provides intelligent and efficient auxiliary tools for lesson preparation, classroom management, online correction and

multi-dimensional learning evaluation. Teachers can push high-quality learning resources in real time, monitor students' whole-process learning performance covering daily assignments, classroom participation, periodic quizzes and final assessments, and achieve data-supported personalized precise teaching.

The network server terminal integrates abundant teaching resource libraries, professional teaching auxiliary tools and intelligent cloud management platforms. It can provide synchronized textbook resources, massive examination question banks and extended reading materials to support diversified teaching and personalized learning. Meanwhile, the cloud management system realizes whole-process classroom data monitoring, dynamic learning data aggregation and quantitative teaching effect evaluation, effectively stabilizing the intelligent interactive teaching environment. Equipped with pre-installed high-quality teaching resources and personalized learning terminals, the platform constructs an efficient, intelligent and eco-friendly mobile learning ecosystem for college English speculative reading instruction.

Based on the functional strengths of mobile auxiliary platforms and the practical characteristics of college English speculative reading teaching, this study summarizes the platform's instructional advantages from four core dimensions: online resource acquisition, real-time teacher-student interaction, accurate learning data feedback and whole-process learning supervision. The summarized technical advantages provide strong practical support for the design and implementation of the progressive speculative reading teaching model proposed in this research.

2.2 Teaching Process Design

This study designs a complete three-stage speculative reading teaching process based on mobile auxiliary platforms, centering on the core cultivation objectives of questioning, analyzing, reasoning and evaluating. Different from conventional reading teaching that emphasizes information memorization, this process focuses on guiding students to conduct active critical thinking throughout pre-class, in-class and after-class stages, so as to gradually internalize speculative reading competence.

(1) Pre-class Speculative Preview: Trigger Preliminary Critical Thinking

At the pre-class stage, teachers abandon the single preview mode of vocabulary and text memorization. With the support of mobile auxiliary platforms, teachers release targeted speculative preview tasks, including text background browsing, viewpoint prediction, open-ended question raising and preliminary logical sorting. Students are required to independently read the text, sort out the author's core arguments, record doubtful logic, and put forward at least two personalized questions about text viewpoints, writing logic or argument rationality. Such tasks guide students to shift from passive acceptance to active questioning, effectively activating their preliminary speculative awareness. After students submit their preview results, the platform automatically collects learning data, including students' question types, doubtful points and preview feedback. Teachers can accurately grasp students' preliminary thinking deficiencies and design targeted in-class critical discussion links.

(2) In-class Critical Interpretation: Deepen Logical Analysis and Viewpoint Evaluation

The in-class stage is the core link of speculative reading cultivation. Relying on the real-time interaction function of the mobile platform, teachers organize multi-dimensional critical reading activities rather than simply explaining text content. First, teachers guide students to analyze the text structure, sort out the logical relationship between arguments and evidence, and distinguish objective facts from subjective viewpoints in the text. Second, combined with the preview questions raised by students, the class launches group discussions and online comments, encouraging students to question the rationality of the author's expression, compare different interpretative perspectives,

and put forward personalized evaluation opinions. Third, teachers push targeted reading cases and contrastive materials through the platform to help students conduct comparative analysis, identify text limitations and cognitive biases, and form independent judgment. This series of interactive activities effectively trains students' abilities of logical reasoning, critical discrimination and multi-angle evaluation.

(3) Real-time Learning Feedback: Accurately Locate Thinking Deficiencies

During classroom teaching, the mobile platform supports real-time quizzes, online voting and data statistics. Teachers release critical reading test items focusing on text reasoning, viewpoint judgment and logical analysis, rather than basic knowledge memorization. The platform instantly generates accuracy data and error distribution, which intuitively reflects students' weak links in speculative understanding. According to the overall learning situation, teachers dynamically adjust teaching progress, conduct targeted explanation for universal thinking misunderstandings, and provide personalized guidance for individual students. Real-time data feedback ensures that speculative teaching is problem-oriented and greatly improves the pertinence of critical thinking cultivation.

(4) After-class Extended Speculation: Realize Ability Internalization

After-class extended training is an important supplement to in-class speculative teaching. Teachers push hierarchical extended reading materials and critical thinking tasks through the mobile platform, including text re-evaluation, argument generalization, critical reflection journals and viewpoint rewriting exercises. Students need to integrate in-class analysis results, re-examine the text logic, evaluate the author's writing intention and argument rationality, and output independent critical opinions. Different from traditional mechanical exercises, after-class tasks focus on the transfer and application of speculative thinking. At the same time, the platform records students' extended learning tracks, forming a complete closed loop of "preview speculation—in-class criticism—after-class extension", which steadily improves students' long-term speculative reading competence.

2.3 Teaching Evaluation Design

To scientifically evaluate the implementation effect of mobile-assisted speculative reading teaching and comprehensively reflect students' critical thinking development, this study adopts a hybrid evaluation framework combining formative process evaluation and summative outcome evaluation. Different from traditional reading evaluation that merely focuses on final scores, this system takes students' speculative reading performance and critical thinking growth as the core evaluation objectives. Relying on the big data statistical and recording capabilities of the mobile auxiliary platform, the whole-process learning behavior of students can be quantitatively captured, including classroom response efficiency, task completion accuracy, participation frequency of speculative discussion, and quality of autonomous thinking output, which supports multi-dimensional, refined formative assessment.

In terms of summative evaluation, this study takes the post-experimental speculative reading test scores as the core measurement index, focusing on investigating students' comprehensive abilities of text logic sorting, viewpoint discrimination, rational analysis and independent evaluation. By comparing the score changes of the experimental class and the control class before and after the experiment, the teaching effectiveness of the mobile platform-based speculative reading model is quantitatively analyzed. In order to ensure the objectivity, accuracy and systematicness of evaluation data, this study introduces multiple mathematical calculation models in the platform data processing process to realize standardized quantification of teaching effect.

The relevant formulas involved in the construction and data statistics of the mobile auxiliary

platform are as follows, which are used for learning data identification, text feature extraction, student learning behavior quantification and teaching effect similarity comparison, so as to provide reliable data support for speculative reading teaching evaluation.

The relevant formulas involved in the construction of the mobile platform mainly include:

$$\frac{\delta K}{\delta n} = div(e(d,f,n) \times \nabla K) \quad (1)$$

K-image brightness matrix, n-time scale, div-image divergence, $e(d,f,n)$-transduction function, ∇-gradient solution calculation

$$e(d,f,n) = l(|\nabla K_{\varphi}(d,f,n)|) \quad (2)$$

∇K_{φ}-the gradient value of image K_{φ} after Gaussian smoothing

$$\frac{K^{x+1}-K^{x}}{\beta} = \sum_{f=1}^{q} B_f(K^x)K^{x+1} \quad (3)$$

β- iterative step size, B_f- matrix of feature image diffusion degree

$$K^{x+1} = (U - \beta \sum_{f=1}^{q} B_f(K^x))^{-1} K_x \quad (4)$$

B_f-diagonally dominant tridiagonal matrix

It is generally believed that keywords are related to the number of occurrences of words, and the more occurrences of words, the more likely they are keywords.

$$R_x = a \times \log(\frac{T}{t+1}) \quad (5)$$

T- the total number of sentences in the corpus, t- the number of sentences with vocabulary in the corpus, a- the number of times the vocabulary appears in the previous sentence

The probability of document generation is:

$$\prod_u p(u|k) \quad (6)$$

k- topic, u- words in the article

$$\mathrm{Sim}(\mathrm{R},\mathrm{R}') = \frac{\sum_{x=1}^{s} R_x \times R'_x}{\sqrt{\sum_{x=1}^{s} {R_x}^2 \times \sum_{x=1}^{s} {R'_x}^2}} \quad (7)$$

$\mathrm{Sim}(\mathrm{R},\mathrm{R}')$-cosine angle, the larger the result, the higher the similarity between the two sentences.

$$\mathrm{Sim}(\mathrm{D}_1,\mathrm{D}_2) = \frac{\sum_s g_x}{\max(\mathrm{PC1},\mathrm{PC2})} \quad (8)$$

g_x-vocabulary, $\mathrm{Sim}(\mathrm{D}_1,\mathrm{D}_2)$-similarity of two sentences

$$\mathrm{MRR} = \frac{1}{|W|} \sum_{x=1}^{|W|} \frac{1}{\mathrm{rank}x} \quad (9)$$

W- total number of test questions, rank- location of exact answers among all answer options

3. Experiments in College English Speculative Reading Teaching

The experimental class and control class in the English reading teaching experiment was also conducted to study the practical application impact of the teaching of critical reading in English in colleges and universities based on the mobile auxiliary platform. Comparing the English reading assessment scores between both classes before and after the experiment, the experimental class

adopted the mobile auxiliary platform for the English critical reading teaching technique; the traditional class adopted the traditional English reading teaching method. What transpires is as follows:

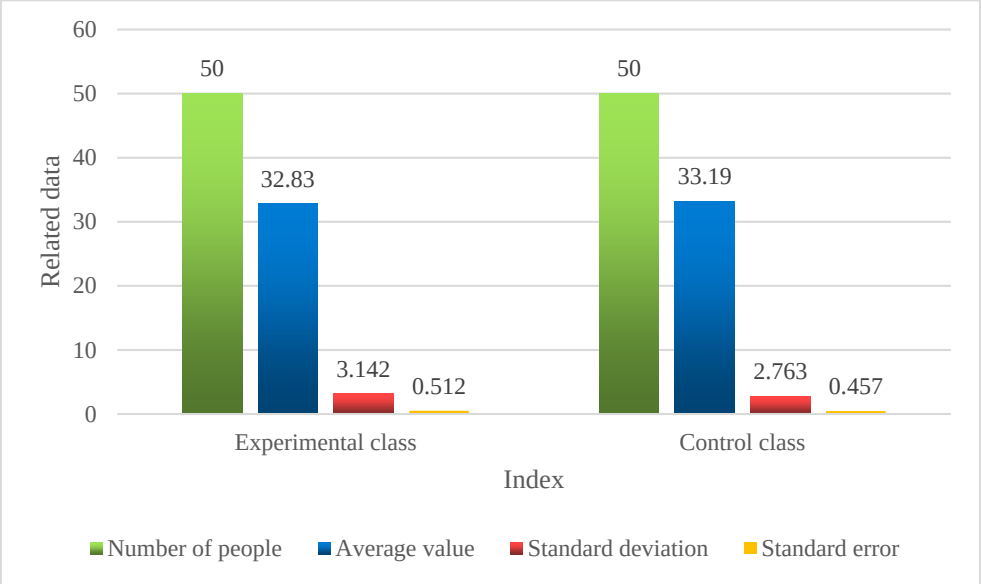

Figure 1. Comparison of the experimental class's pre-experimental scores with those of the control group

We compare the pre-experiment scores between the experimental class and the control class (see Figure 1). Clearly we have a total of 50 experimental personnel throughout both classes. Before the trial, the average result for the experimental class and the control class on the 50-point English reading test was 32.47 and 33.19, respectively; these results do not differ significantly with each other either means or standard errors.

Table 1. The independent sample test results before the two-class grade experiment

	Levene test for variance equation		T-test for the mean equation					
	F	Sig.	Df	Sig (bilateral)	Mean difference	Standard error value	95% confidence interval for difference	
							Lower limit	Upper limit
Assuming equal variances	0.496	0.425	75	0.796	-0.36	0.643	-1.32658	1.18435
Assuming unequal variances			73.784	0.796	-0.36	0.643	-1.32863	1.18547

Independent samples tests result before two class achievement experiment is given in Table 1. There was no significant difference between the two classes' English reading score before the trial (Sig = 0.796 > 0.05). In other words, the two classes' English reading proficiency level is approximately equal before the teaching experiment; thus, they can be used appropriately. Control group and experimental group are the two classes receiving English reading instruction over a two-month period. After two months, we carried out an English reading proficiency test on these two classes to analyze the comparison of the scores before and after the teaching experiment of the two classes.

The average English reading score for the experimental class increased by 4.65 points (from

32.83 points to 37.48 points) after two months of teaching English reading on the mobile auxiliary platform; while the English reading score for the control class that used the traditional teaching method after two months was only 33.76 points and did not differ greatly from its pre-experiment score of 33.19 points. Now we need to carry out independent sample testing in order to determine if our experimental data is statistically significant.

Table 2. The independent sample test results after the two-class grade experiment

	Levene test for variance equation		T-test for the mean equation				
	F	Sig.	Sig(bilateral)	Mean difference	Standard error value	95% confidence interval for difference	
						Lower limit	Upper limit
Assuming equal variances	0.213	0.596	0.024	3.72	0.49216	2.13427	4.26973
Assuming unequal variances			0.024	3.72	0.49216	2.13372	4.26981

Independent samples test results for the two-class accomplishment experiment are shown in table 2. From the detection result we know that Sig value is 0.024, it is lower than 0.05; the English reading instruction based on the mobile auxiliary platform has significant improvement over the control class of traditional English reading instruction (the average value was 3.72 points higher than that of the control class) comparing the English reading scores between both classes before and after the experiment. This proves the effectiveness of using a mobile auxiliary platform for teaching English reading to improve students' English reading abilities.

A questionnaire survey was carried out with these students after the teaching experiment through the mobile assistant platform investigating their interest and classroom participation in the critical English reading teaching using the mobile assistant platform. The students are interested in the use of mobile assistance platforms for English reading. Clearly, there are 58% of students enthusiastic about using the mobile auxiliary platform to teach English reading while only 22% disagreed and 20% had no interest. Some students remain uninterested in the instruction of speculative English reading based on the mobile auxiliary platform. Teachers need to adopt essential instructional techniques and approaches to pique students' interest in reading English and keep them enthusiastic for the subject.

4. Conclusion

This study focuses on the integration of mobile auxiliary platforms and college English speculative reading teaching, aiming at the problems of single teaching mode, insufficient critical thinking cultivation and low teaching efficiency in traditional college English reading instruction. By analyzing the functional advantages of mobile auxiliary platforms and the teaching characteristics of speculative reading, this study constructs a whole-process teaching design system covering pre-class preview, in-class interactive teaching and after-class extended training, and establishes a mixed teaching evaluation system combining process and result assessment with platform big data and mathematical models.

The two-month controlled teaching experiment verifies that the mobile-assisted teaching model can effectively optimize college English reading teaching procedures, activate students' reading initiative, and significantly improve students' English reading scores and speculative reading

competence. With the support of mobile intelligent technology, the time and space limitations of traditional reading teaching are broken, diversified speculative learning scenarios and personalized learning guidance are realized, which effectively makes up for the deficiencies of traditional exam-oriented reading teaching and achieves remarkable teaching reform effects.

Educational informatization is an inevitable trend of modern college English teaching reform. Mobile auxiliary platforms, as important intelligent teaching tools, show outstanding practical advantages in stimulating students' critical thinking awareness and improving reading teaching quality, which is worthy of popularization in college English speculative reading teaching. Nevertheless, the integrated application of mobile platforms and speculative reading teaching still has room for optimization, and the practical teaching system needs continuous improvement in long-term teaching practice.

This study also has certain limitations. The research sample scale is limited, and this study only observes the short-term teaching effect of the innovative model, lacking long-term tracking of students' critical thinking development. In future research, the research scope will be further expanded, and more diversified and targeted teaching optimization strategies will be explored to continuously improve the sustainable application value of mobile auxiliary platforms in college English speculative reading teaching.

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