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Course Design for Improving Oral Communication Ability in Automotive English under POA Theory

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Abstract: The existing oral English teaching methods for automotive majors focus on grammar and vocabulary, lacking situational simulation and practical activities, which makes it difficult for students to apply the knowledge they have learned to actual communication. Based on this, in order to improve the practical application ability of English oral communication for automotive students, this article designs a course on enhancing automotive English oral communication ability based on the Production Oriented Approach (POA) theory. Firstly, the course conducts research and analysis to understand students' actual needs and determine teaching objectives; secondly, based on the characteristics of the automotive profession, designs diverse language tasks; finally, records the experimental results through course experiments and follow-up surveys. The results showed that most students maintained a high level of accuracy in the expression process, with an accuracy rate between 85% and 98%, and a report clarity score of 94. Research has shown that curriculum design based on POA theory can significantly improve students' professional English speaking ability, providing important reference for cultivating international automotive engineering talents.

1. Introduction

In modern society, with the rapid development of the automotive industry and the increasing degree of globalization, automotive engineers not only need to possess solid professional knowledge, but also need to have high English oral communication skills, especially in the field of communication. English, as an internationally recognized language, plays a crucial role in communication in the automotive industry. However, existing research shows that many non-native English speaking automotive students often have problems with fluent expression, lack of professional vocabulary, and cultural background knowledge when applying English speaking in practice. This language barrier not only hinders students' progress in academic and professional careers, but also affects talent mobility and collaboration in the global automotive industry. To address this issue, this article proposes a new curriculum design approach based on the output oriented theory, aiming to enhance students' English oral communication skills in the professional

field by simulating real work scenarios. The value of this study lies not only in filling the gap in existing research, but also in providing a new practical path for automotive English teaching.

The core of this study is how to use the Production Oriented Approach (POA) theory to design an effective English speaking course to improve the English communication skills of automotive students. On this basis, the study first clarified the actual needs of students in professional English learning through research and needs analysis; secondly, this study designed multiple language tasks closely related to the automotive industry, such as technical discussions, project presentations, and international conference simulations, in order to provide students with language training in real-life work scenarios; finally, this study validated the effectiveness of the course through experimental research and data analysis.

The research framework of this article is as follows: Firstly, the article reviews existing literature, analyze in detail the problems in oral English teaching for automotive majors, and elaborate on the basic principles of POA theory and its potential application in language teaching; then, the article introduces the specific steps of curriculum design, including requirements analysis, task design, teaching strategies, and evaluation methods; finally, the article evaluates the effectiveness of course implementation through an experimental study, and further discusses the advantages and room for improvement of the course design through student feedback and data analysis. Through the detailed exploration of these three parts, this article not only reveals the necessity of improving the English oral communication ability of automotive students in the context of globalization, but also provides specific methods and ideas for how to apply POA theory in practical teaching.

2. Related Work

In recent years, with the increasing demand for international talents in the automotive industry, many studies have begun to focus on how to improve the English oral communication skills of automotive majors. These studies emphasize the importance of English speaking skills in international technical exchanges and project collaborations. Some studies have attempted to improve students' oral proficiency through classroom teaching methods and flipped classroom models, achieving certain results. Zheng Xuelin [1] believes that with the internationalization of society and the updating of English language teaching concepts, the importance of English oral teaching is becoming increasingly prominent, and teachers' language input strategies directly affect the improvement of students' English oral ability. Pan Xiaodi [2] believes that in today's globalized development, the demand and comprehensive requirements for applied talents in society are gradually increasing. The importance of English oral communication ability for applied talents has been elevated to a new height. How to more effectively shape the English oral ability of college students has become an urgent challenge that applied universities need to overcome. He put forward the idea of "expanding internal and external" in order to provide inspiration for improving the effectiveness of college English oral proficiency training from aspects such as proportion, connotation, and diversity. Qu Yiyi and Yu Hanbin [3] explored the innovative research of artificial intelligence technology in college English oral teaching from the perspective of ideological and political education. Pratiwi Z F and Ayu M [4] proposed a plan to improve middle school students' oral skills by using descriptive image strategies. Liu Xin [5] conducted an exploration of classroom teaching strategies for English oral communication. However, these studies often lack in-depth analysis of actual language needs in professional contexts, leading to difficulties for students in applying English in real-life work scenarios. Especially for the particularity of the automotive profession, existing research has not been able to design corresponding language tasks and teaching methods based on industry characteristics, which has become a major shortcoming in current research.

In addition, some scholars have attempted to improve students' English speaking ability through task-based language teaching methods, believing that real tasks and situations can better promote language learning outcomes. Yang Y [6] conducted a comparative study of English oral and written discourse engagement resources. Hu R [7] conducted a corpus based study on the usage characteristics of English spoken language chunks. Chen Z R [8] believes that with the rapid development of science and technology, speech recognition has become a new and main form of human-computer interaction. English, as an international language, connects cultural and economic exchanges around the world, which is of great significance for the optimization research of English oral command speech recognition systems. Xiong Q [9] believes that traditional English oral semantic recognition models require manually crafted pronunciation dictionaries and pre-defined audio and phoneme alignment, resulting in poor recognition performance. In order to improve the efficiency of English oral semantic recognition, he studied the oral semantic feature recognition method of English oral databases under the framework of machine learning, and then studied the semantic recognition scheme of English conversations based on the results of Chinese name recognition. In order to improve the pronunciation accuracy of English oral reading, Wang S and Shi X [10] combined artificial intelligence technology to construct an artificial intelligence virtual English reading oral pronunciation accuracy correction model. They analyzed the process of using intelligent speech technology for speech synthesis, proposed a statistical parameter speech based on hidden Markov chain, and improved the system algorithm to become an intelligent algorithm that meets the requirements of artificial intelligence virtual English reading oral pronunciation accuracy correction system. Although this method is effective in general English teaching, its application in the field of professional English is relatively limited. These studies failed to fully consider the specific needs and technical background of the automotive profession, resulting in a disconnect between course content and students' actual career development needs. In addition, most studies lack systematic evaluation mechanisms, making it difficult to scientifically measure teaching effectiveness and student progress. Therefore, how to better integrate professional background and language learning methods in curriculum design has become an urgent problem to be solved.

3. Method

3.1. Requirements Analysis and Teaching Goal Setting

In order to ensure that the course design can effectively improve the English oral communication ability of automotive major students, a comprehensive needs analysis was conducted first [11]. The study collected specific needs and expectations of students and industry experts for professional English proficiency. Data analysis shows that students mainly face the following problems in professional English learning: lack of mastery of professional vocabulary, inaccurate expression in technical discussions, and lack of confidence in formal communication. Therefore, the teaching objective of the course is set to enhance students' professional vocabulary and expression accuracy through simulating real work scenarios, and to strengthen their confidence in English communication in an international context. Improvement Rate is used to calculate the rate of improvement in students' grades between the initial and final tests, reflecting their progress in the course:

$$\text{Improvement Rate} = \frac{\text{Final Score-Initial Score}}{\text{Initial Score}} \times 100\% \quad (1)$$

3.2. Task Design and Situational Construction

Based on the Production Oriented Approach (POA) theory, the core of curriculum design lies in

task driven and situational teaching [12-13]. We will divide the entire course into multiple modules, each centered around a specific automotive industry theme, such as engine technology exchange, discussions on autonomous driving projects, and international auto show presentations, specifically:

Engine technology exchange module: Students will be grouped to simulate technical representatives from different companies and discuss the advantages and disadvantages of the latest engine technology in English. Each group of students is required to prepare a technical report and engage in discussions and debates in class. This not only exercises students' English expression ability, but also helps them become familiar with and master relevant professional terminology.

Autonomous driving project discussion module: Students will be assigned to different roles, such as technical leader, project manager, etc., to conduct a simulated meeting for an autonomous driving project. During this process, students need to discuss technical details, project progress, as well as potential risks and challenges in English. Through such simulated scenarios, students can practice effective English communication in team collaboration.

International auto show speech module: Each student is required to prepare a speech about the latest automotive technology or trends, simulating the presentation segment at an international auto show. Through this scenario, students can practice how to confidently express themselves in formal settings, while enhancing their speaking skills and adaptability. Task Completion Index is used to evaluate the performance of each student in the task, combined with multiple scoring criteria (such as language fluency, professional vocabulary usage, expression accuracy, etc.), to provide a comprehensive score:

$$\text{Task Completion Index}=\frac{\sum_{i=1}^{n} w_i \cdot s_i}{\sum_{i=1}^{n} w_i} \tag{2}$$

Among them: S_i is the score of each scoring criterion, w_i is the weight of each scoring criterion, and n is the total number of scoring criteria.

3.3. Teaching Strategies and Interactive Forms

In order to better achieve teaching objectives, we have adopted a series of interactive teaching strategies based on the guiding principles of POA theory [14]. These strategies aim to enhance students' language output ability through active participation and practical operation.

Role playing: In each module, we have set up role-playing sessions. Students will play different roles, such as technical experts, market analysts, customer representatives, etc., and engage in English conversations and communication by simulating real business environments. Role playing can effectively stimulate students' interest in learning, while also providing them with a safe practical platform. Through group discussions and debates, students can learn how to express themselves logically and articulate their viewpoints in English through mutual communication. After each discussion, the teacher will provide detailed feedback to help students identify and correct their language errors, and improve the accuracy and fluency of their expression. We also included multiple real-life industry cases in the course, such as technology innovation projects of specific companies, changes in market strategies, etc. Students need to analyze and discuss these cases in English, and put forward their own opinions and suggestions. $F\text{E Index}$ is used to measure the effectiveness of feedback mechanisms in improving student performance, considering the changes in students' grades before and after receiving feedback:

$$F\text{E Index} = \frac{\sum_{j=1}^{m}(\text{Post}-\text{Score}_j - \text{Pre}-\text{Score}_j)}{m} \tag{3}$$

$\text{Post}-\text{Score}_j$ and $\text{Pre}-\text{Score}_j$ are the scores of the j-th student after and before feedback, respectively, and m is the total number of students.

3.4. Feedback Mechanism and Evaluation Methods

In order to ensure teaching effectiveness, a systematic feedback mechanism has been designed and researched. After each task is completed, teachers will provide detailed feedback based on students' performance, mainly including language accuracy, use of professional vocabulary, logical expression, and fluency. At the same time, students will also engage in self-evaluation and peer evaluation, learning and improving from each other. After the course, we will conduct a comprehensive evaluation that covers students' oral tests, project presentations, and daily classroom performance.

The evaluation results will be used to further optimize the course design. Through data analysis, we can identify which parts of the task have the best performance and which ones still need improvement. For example, if we find that students' language expression in technical discussions is not precise enough, we may increase the amount of related tasks or strengthen vocabulary teaching.

Overall Speaking Ability Score evaluates students' comprehensive oral proficiency by combining their fluency, accuracy, and mastery of professional vocabulary V.

$$\text{Overall Speaking Ability Score} = \alpha \cdot \text{Fluency Scorc} + \beta \cdot \text{Accuracy Score} + \gamma \cdot \text{V} \quad (4)$$

α, β, γ are the weight of each indicator, satisfying $\alpha + \beta + \gamma = 1$.

4. Results and Discussion

4.1. Course Implementation

4.1.1. Experimental Environment and Parameter Settings

In order to evaluate the practical effect of the English oral communication ability improvement course designed under the POA theory for automotive majors, a series of experiments were conducted in a university with a major in automotive engineering. The experimental subjects are third and fourth year automotive engineering students. The experimental group students received English oral course training based on POA theory, while the control group students continued to receive traditional professional English teaching. The experiment was conducted in a real classroom environment, with all courses taking place in standard classrooms. Each class lasted for 90 minutes, twice a week, and lasted for 16 weeks. During the experiment, the English proficiency of all students was evaluated through standardized tests before the start of the experiment to ensure comparability between the experimental group and the control group at the starting point. The experimental parameters mainly include students' English speaking fluency, mastery of professional vocabulary, accuracy of expression, and performance in different tasks.

4.1.2. Evaluation Indicators and Calculation Methods

In order to scientifically evaluate the effectiveness of the course, we have set multiple evaluation indicators, including:

Oral fluency: it is evaluated by language speed (words per minute) and pause frequency. Data collection records students' language performance in different tasks through recording devices, and uses speech analysis software to calculate the word output and pause frequency per minute.

Mastery of professional vocabulary: it evaluates students' frequency and accuracy of using professional vocabulary in tasks. The evaluation criteria are the usage rate (percentage of professional vocabulary to total vocabulary) and accuracy (percentage of correctly used professional vocabulary to total vocabulary) of each student in the task.

Accuracy of expression: it is mainly measured by the correctness of grammar and the complexity

of sentence structure. Using grammar analysis tools to analyze students' spoken texts, calculate the grammar error rate and the proportion of complex sentence structures.

Task completion rate: it scores the completion status of each task, and the scoring criteria include the logic, completeness, and professionalism of the task. The scoring is independently conducted by three English teachers with automotive backgrounds, and the average value is taken.

Student feedback: it collects students' satisfaction, participation, and self perceived progress in the course through a questionnaire survey. The questionnaire consists of 5 dimensions, each of which is rated using a five level scale.

4.2. Result Analysis

4.2.1. Technical Discussion Tasks

The experimental group of students conducted a simulated technical discussion on the battery management system for new energy vehicles. In the experiment, students were divided into different groups, and each group was required to play the roles of technical manager, R&D engineer, and market analyst in the discussion. The entire discussion process is recorded, and the data is used to evaluate oral fluency, mastery of professional vocabulary, and accuracy of expression.

The results of the technical discussion task are shown in Figure 1 (the number of words and pauses per minute are shown in Figure 1 (a), and the usage and accuracy of professional vocabulary are shown in Figure 1 (b)).

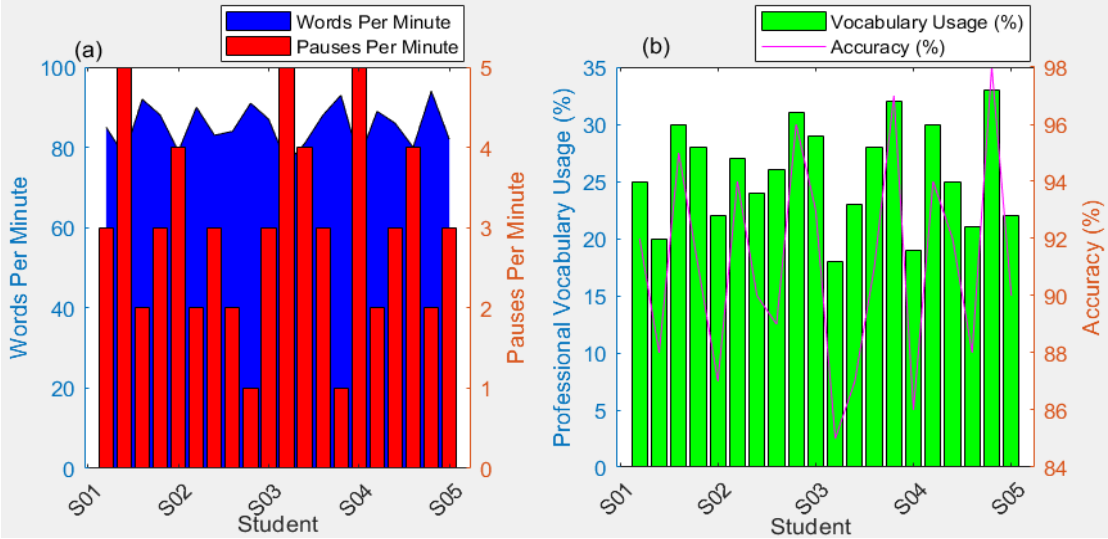

Figure 1: Results of technical discussion task

The usage and accuracy of professional vocabulary: From the figure, it can be seen that the experimental group students generally have a higher usage rate of professional vocabulary, which shows that they can effectively use professional terms related to the automotive industry in technical discussions. Most students maintain a high level of accuracy in their expression process, with an accuracy rate ranging from 85% to 98%. High accuracy indicates that students have more precise language expression and fewer grammar errors in professional contexts.

From the comprehensive analysis of these two subgraphs, we can conclude that curriculum design based on POA theory has a significant effect on improving students' English speaking ability. Students have not only shown significant improvement in the fluency of language output, but also made significant progress in the use and accuracy of professional vocabulary. These data provide us with strong evidence that this teaching method has good effects in practical applications. Future

teaching can continue to optimize task design to further improve students' English speaking ability, especially in reducing pauses in expression and improving the accuracy of vocabulary use.

4.2.2. Project Reporting Tasks

Students are required to prepare and give an English presentation on the autonomous driving project. The experimental group students underwent role-playing and situational simulation training before reporting, while the control group students only engaged in regular English speech practice. The reporting process was scored by three reviewing teachers, and the results showed that the experimental group students scored significantly higher than the control group in terms of logical and professional expression, and the task completion evaluation was also more excellent. The results of the project report task exploration are shown in Figure 2.

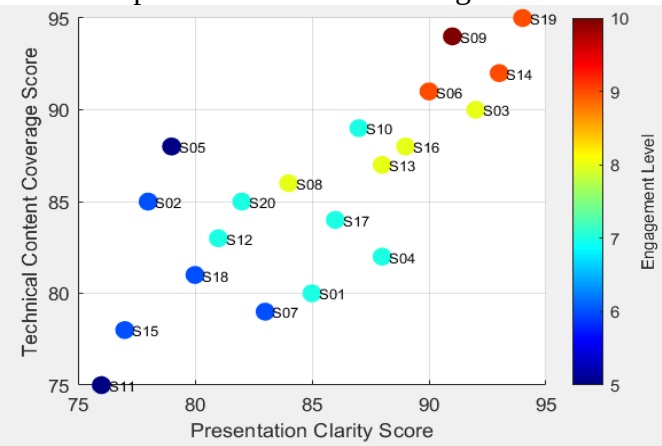

Figure 2: Exploration results of project reporting tasks

It can be seen that the clarity score of most students' presentations ranges from 78 to 94, while the technical content coverage rate ranges from 75 to 95. This score distribution indicates that most students are able to clearly express their views in project presentations, and the content coverage is relatively comprehensive. However, some students' scores showed some differences. For example, S03 and S19 both have high scores, with report clarity scores of 92 and 94, and technical content coverage rates of 90 and 95, respectively. These students clearly performed well in the project report, conveying information clearly and fully covering technical details.

Overall, Figure 2 reveals several interesting patterns: firstly, there is a certain positive correlation between report clarity and technical content coverage, indicating that students who can express themselves clearly often also cover technical content well. Secondly, participation has a significant impact on students' performance, and students who actively participate in classroom activities and discussions are more likely to perform well in formal presentations. This provides us with insights into teaching strategies: in future curriculum design, more interactive activities can be introduced to stimulate students' enthusiasm and participation, thereby improving their overall performance. Through such optimization, the effectiveness of the course can be further improved, enabling more students to make progress in their professional English oral communication skills.

4.2.3. International Conference Simulation

Simulating an international automotive engineering conference where students are required to give an English speech on the future development direction of new energy vehicles. This experiment mainly evaluates students' language output ability in high-pressure situations and their performance in complex language tasks. The simulation results of the international conference are

shown in Figure 3.

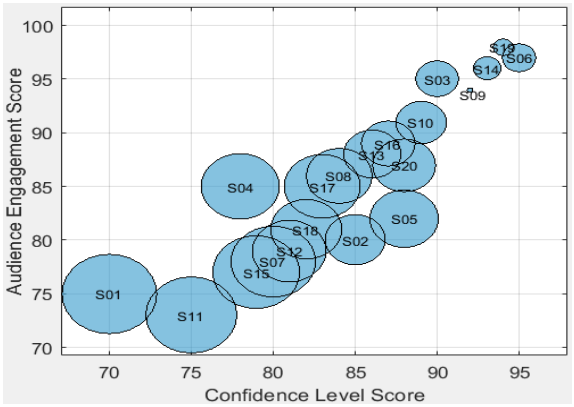

Figure 3: Simulation results of international conferences

This bubble chart presents students' performance in an international conference simulation task, focusing on three aspects: confidence, audience engagement, and deviation in presentation time. Each bubble in the figure represents the position of a student, the x-axis represents the confidence score, and the y-axis represents the audience engagement score. The size of the bubble reflects the degree of deviation between the reporting time and the target time.

Firstly, we can observe that the confidence scores of most students are concentrated between 70 and 95, while the score range for audience engagement is slightly higher, distributed between 73 and 98. This shows that most students perform relatively steadily in simulated meetings, able to attract the audience's attention to a certain extent and maintain confidence. However, there are still significant differences among different students. These data points indicate that these students demonstrated excellent performance in the simulation task, not only confidently delivering speeches but also effectively capturing the audience's attention. Their bubbles are small, indicating a small deviation between the reporting time and the target time, and good control.

4.2.4. Feedback Loop and Improvement

The experimental group students received feedback from teachers and classmates multiple times during the course and made improvements. The purpose of this experimental setup is to evaluate the impact of feedback mechanisms on students' language output. We will conduct oral tests for students in the mid-term and final exams respectively.

The feedback loop and improvement results are shown in Table 1.

Table 1: Feedback loop and improvement results

Student number	Initial score	Midterm score	Final score
S01	65	70	78
S02	72	75	82
S03	68	73	80
S04	70	74	81
S05	74	78	85
S06	71	76	84
S07	69	72	80
S08	66	71	79
S09	73	76	85
S10	67	70	82

The final score further demonstrates the progress of students throughout the entire learning

process. All students had significantly higher final scores than their initial scores. For example, S05 increased from an initial score of 74 to a final score of 85, and S03 increased from 68 to 80. This significant improvement indicates that after experiencing a complete feedback loop and improvement process, students are able to better grasp the course content, demonstrate stronger language abilities and technical knowledge.

The effectiveness of teaching feedback: From the overall data, this experiment clearly demonstrates the importance of feedback loops in student learning. Through regular feedback and targeted improvements, students can continuously enhance their skills and knowledge reserves. This feedback mechanism not only helps low scoring students improve quickly, but also helps high scoring students further improve. This also reveals an effective educational strategy: continuous feedback and self-improvement are key to improving learning outcomes.

4.2.5. Case Analysis Task

The results of the case analysis task are shown in Table 2.

Table 2: Results of case analysis task exploration

Student number	Pre-analysis score	Post analysis score	Improvement percentage (%)	Critical thinking score
S01	60	75	25	8
S02	68	82	20.59	9
S03	65	78	20	7
S04	63	76	20.63	8
S05	70	85	21.43	9
S06	66	80	21.21	8
S07	64	77	20.31	7
S08	62	74	19.35	7
S09	69	83	20.29	8
S10	67	81	20.9	9

The "Critical Thinking Score" column displays students' ratings of their critical thinking abilities after completing tasks. This rating is a comprehensive evaluation of students' logical reasoning ability, problem-solving ability, and ability to deconstruct and integrate complex information demonstrated in analyzing tasks. Most students score between 7 and 9 in critical thinking, with S02 and S05 both receiving 9 points, indicating a high level of critical thinking ability during the analysis process. They are able to analyze problems in depth and propose effective solutions. On the contrary, students with slightly lower scores (such as S03 and S07) scored 7, although they also showed some critical thinking ability, there may be room for improvement in in-depth analysis and comprehensive evaluation of case information.

5. Conclusion

This study aims to design and implement an English oral communication skills enhancement course for automotive students based on the Production Oriented Approach (POA) theory. The experimental results indicate that curriculum design based on POA theory has achieved significant results in improving students' English oral communication skills. Students have shown significant progress in each task, whether in language fluency, use of professional vocabulary, or communication skills in practical situations. Although this study has achieved some positive results, there are also some limitations. Firstly, the sample size of the study is relatively small and limited to

automotive students from a specific university, which may limit the generalizability of the research results. Secondly, although the design of experimental tasks has tried its best to simulate real work scenarios, it still cannot fully reproduce the complexity and variability of actual work, which may affect the effectiveness of students' use of language skills in reality. In addition, this study mainly focuses on short-term language proficiency improvement and fails to fully examine the impact of the curriculum on students' long-term career development. Future research should further expand the sample size and include more students with backgrounds and majors to enhance the generalizability of the results. Future research can be expanded in several directions: Firstly, it is recommended to promote this type of curriculum design based on POA theory among students from different backgrounds and cultural environments to verify its broad applicability and effectiveness; secondly, task design can be further optimized by incorporating more interdisciplinary and cross-cultural communication contexts into the curriculum, helping students develop language skills and professional communication skills in a broader international environment.

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