Application of Science and Technology Project Learning in English Linguistics Teaching with Integration of Machine Learning

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Abstract. Linguistics is a compulsory course for college English majors. The purpose of setting up linguistics is to cultivate students' English language awareness, improve their comprehension of English language, and jump out of the Chinese-English language circle. Project learning came into being under this trend. It is student-centered and focuses on improving students’ desire for learning. It also differs from the past in teaching mode. Project learning allows students to pass through a relatively free space. Questions to stimulate students’ desire to explore, so as to trace the source of the entire problem, such links are discovered by students' cooperation is essential. They are not teachers and professors. This can improve students' learning efficiency, increase their understanding of English language, and increase their confidence in learning English linguistics. Therefore, this paper discusses the application of science and technology project learning in English linguistics teaching with integration of machine learning. In our designed model, the neural networks and the PCA are integrated to present the proper combination. The experimental performance is validated through the public databases and the proposed model outperforms compared with the other state-of-the-art methodologies.

Keywords: Science and technology project learning, English, linguistics, machine learning, neural networks, PCA

1. Introduction
The “Introduction Course to Linguistics” is a compulsory professional knowledge course for undergraduates majoring in English. The ultimate goal of teaching is to cultivate language awareness and develop rational thinking. Some domestic scholars' findings on the teaching of English linguistics show that linguistics classroom teaching is based on teacher-led knowledge and student-based notes, students are passively accepted, teaching forms are single, and teaching results are not ideal. Wu Zhuang and Wen Weiping mainly investigated the students’ understanding and expectation of the course: Although the students as a whole have relatively clear understanding of the importance of the linguistics introduction course, their interest in learning is not high, and their efforts are also low. The students expect to receive the lessons from this course mainly to develop the ability to analyze and solve problems, master scientific methods and guide English learning. In addition, domestic scholars' research on linguistics curriculum teaching has basically focused on problems and countermeasures in
teaching. Most of them are just introductions or summaries of their own classroom teaching experience, and theoretically driven empirical research is extremely rare.

Figure 1. The Teaching Development Timeline

Linguistics is a compulsory course for college English majors. The purpose of setting up linguistics is to cultivate students' English language awareness, improve their comprehension of English language, and jump out of the Chinese-English language circle. However, our country is affected by the traditional education model very seriously. English has always been dumb-style teaching, and teachers are the main body. English learning is a form of recitation of words, back sentences, and reading comprehension. This kind of rigid teaching has a negative impact on colleges and universities in their teaching of linguistics. Linguistics itself is more complex, and there are also more linguistic schools and content. Simply memorizing it by rote will waste a lot of time. The result is that students can lose interest in learning. Therefore, college English majors promote project learning by letting English language teaching go out of the traditional model and making English teaching more interesting and diverse. This is beneficial to students' effective learning. In the learning process of the various disciplines, there will be different problems because of different modes of thinking and learning personality. Comprehensive English as their main course reflects the most direct. Comprehensive English classes must help students find the most suitable mode of thinking, learning personality and language practice through a practical learning model based on the learning characteristics and learning needs of the different students in the context of big data. Therefore, for our research, we should consider the following aspects.

1. Blend multiple learning modes. Traditional teaching responds to all general teaching problems in a teaching mode, and traditional learning responds to all learning problems in a single way. With the development of science and technology, the fusion learning mode came into being. The integrated learning model includes online learning and offline learning, independent learning and collective learning, classroom learning and independent inquiry.

2. Transforms by the knowledge standard to the thought standard. The knowledge standard study view thought that the knowledge is occupies leads the position, the gain had the knowledge conclusion is it pursue ultimate objective, the study process is regarded as is the sole cognition process. The thought standard study view no longer take the knowledge as the study only goal and the ultimate objective, obtains the thinking mode and ability promotion more importantly. The big data time knowledge is inexhaustible, complex, exhausts the life also to grasp all knowledge, the student most needs to study has the value guidance and question consciousness ponder ability, but is not merely the concrete knowledge.

3. Inferred statistics refer to the method of inferring the characteristics of the overall data it represents from sample data. For example, to understand the English level of college students across the country, it is impossible for researchers to then measure each student's English proficiency, but to sample individual individuals for evaluation, and then infer the overall characteristics, which is to infer
the statistics to solve the problem. In the actual foreign language teaching and research statistics, we do not need to collect statistics for all the data. Instead, we sample representative samples from the population according to certain rules to then conduct research, and infer the entire population from the sample. Inferred statistical methods mainly include statistical tests, statistical analysis and non-parametric statistical methods. Obviously, describing statistics is the basis for inferring statistics. Descriptive statistics are general analysis of data, and inferred statistics are deep processing of data.

Project learning is mainly through the "project" form of learning. It is under the guidance of a teacher to teach a relatively independent project to students themselves. Information collection, project design, project implementation and final evaluation are all the responsibility of the students themselves. Students learn and grasp the entire process and each The basic requirements in a link. The most significant features of project learning are project-based, teacher-directed, and student-centered. Through project learning, students are not passively involved in learning. Instead, they actively study knowledge and internalize linguistic knowledge. They can also increase their interest in linguistics and change boring English language learning to some extent. State, conducive to student linguistics learning.

![Figure 2. The Neural Network Organizations](image)

Language teaching is different from other subjects. It is a language habit that people have formed over a long period of time. It also has a variety of ways of expressing language. This intangibly increases the difficulty of teaching linguistics. In accordance with our traditional teaching model, it can also help student master basic English skills, but at the same time, it will make students lose their linguistic diversity. It can be said that the current college English teaching should be a positive and innovative teaching model. It will focus on the teaching of students, truly consider the students' internal English learning needs and student level, and then form a new type of sub-division and graded advanced teaching model, especially the need Students' English ability to apply such as learning ability and listening and speaking ability should be effectively valued. Based on the big data environment, the innovation teaching model of English course in colleges and universities can be carried out from three aspects: word teaching, oral teaching and corresponding writing teaching. In today's quality education, vigorously carry out science and technology model activities, so that young people can apply the theoretical knowledge learned in the classroom to then practice by participating in activities, so that students can discover and master the whole process of some scientific and technological model activities and get results. The improvement of students' overall qualities has led them to become creative talents indispensable to the society.

The science and technology model activities have established a pursuable goal for students and have fully inspired students' interest. Under the guidance of the teacher, students can actively perceive it, understand it, delve into it, and strive to gain honor. This influences students in an imperceptible manner: To have a hard-working, persevering spirit, there must be an ambition not to give up. In the science and technology model activities, students develop their own hobbies and interests, experience the joy of success, and improve their overall quality.

Thinking, this adds to the difficulty of learning linguistics. Project learning is a contact with a “project” in English linguistics. Through extensive discussion and cooperation between students and teachers, students’ cognition, development, and application of the language they learn are promoted so
that students can master the language more proficiently. English linguistics is actually tracing
the source of English as a language. We can use project learning to compare a certain item in the
English language with a certain item in Chinese. This will make students have a clearer understanding.
Awareness. And this link is discovered by students' cooperation. It is not a teacher or professor. This
can improve students' learning efficiency, increase their understanding of English language, and
increase their confidence in learning English linguistics.

2. English Language Teaching Model Based on Science and Technology Project Learning

2.1 The establishment and evaluation of the model
Because the quality of classroom teaching is a quality system composed of many factors, and the
feeling given by each kind of factors to the appraisers is in many cases a kind of information lacking a
clear boundary, which poses certain difficulties for the accurate evaluation of teaching quality. It is
always the subject of the teaching management department that the evaluation method used is better.
Regardless of the assessment method used, it is often questioned by the assessment object. This paper
corrects the fixed interval standard weighted model, and analyzes the scientificness and rationality of
the evaluation model from the perspective of mathematical technology.

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x_i = 75 + \frac{20}{M - m} (a - m)
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x_i = \lambda \rho x_i + \sum_{i=2}^{4} \rho x_{ij}
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\delta = \sum_{i=1}^{n} (X_{ij} - X_i)^2
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2.2 Project Learning Key Features
In the foregoing, we mentioned many times that the traditional education model in China is teacher-
centered. With the continuous development and progress of education in these years, people have
found that the teacher-centered teaching development model has undergone great crisis and explored
how to use students as the center's teaching mode has become the mainstream idea in education.
Project learning came into being under this trend. It is student-centered and focuses on improving
students' desire for learning. It also differs from the past in teaching mode. Project learning allows
students to pass through a relatively free space and problems to stimulate students' desire to explore,
so as to trace the source of the entire problem. For example, in phonetic learning, when the tongue
sounds differently in different locations, we can also treat it as a project that specifically explores the
role of each department of the tongue in vocalization. This not only enables students to have a detailed
understanding of pronunciation. And know the source of pronunciation that helps improve students'
linguistic learning ability.

Most linguistics courses are taught by English majors. This year, juniors are often the school's
oldest fritters. These students have been well-versed in how to pass exams. In addition, linguistics is
hard to understand, and many students come It is more important to say that mixed tests are more
important than learning linguistics. Therefore, it is critical to mobilize students' learning motivation for
linguistic learning. Linguistics is harder to speak than other English majors, and poorly-student
students are very difficult to learn. Linguists can use project learning to help students learn linguistics.
The project study focuses on group learning. The teacher will make a reasonable allocation to the
group, so that some students with excellent learning will be combined with students with poor
foundation. In this way, members of the team can learn from each other and learn from each other,
which will increase the confidence of students with poor basics in learning English linguistics and
improve students' ability to think interactively and solve problems.

Project learning is a new type of teaching method. Its new not only lies in the teaching mode, but
also in the use of advanced technologies and ideas. Traditional English linguistics teaching often relies
on textbooks to study rigid textbook knowledge, which makes linguistics learning more boring.
Project learning can use multimedia technology and use animation and video to vividly express some textbook knowledge, which will facilitate students’ memory and reduce the difficulty of linguistic learning.

The project team plays a major role in the student body and it requires everyone to play a role in a small group. When the teacher communicates with each group, he or she can find out which students are not well-versed in linguistic knowledge. In this way, combining the students’ knowledge that is not in place can sum up the difficulties of this lesson and then provide detailed answers. This will not only allow students to better understand knowledge, but also reduce the distance between students and teachers, and increase the friendship between students and teachers. For example, in linguistic dictation learning, the teacher can clearly understand the group's dictation status by examining the group, and then give each student a reasonable opinion and advice, and at the same time give certain errors to some poor students. Encourage to increase students’ confidence in learning linguistics.

2.3 Application of Project Learning in English Linguistics Teaching

The application analysis of project learning in English linguistics teaching requires a qualitative and quantitative approach to test whether project learning can help students improve the internal motivation of learning English linguistics, and whether it is of positive significance to help students master linguistic knowledge.

First, select two classes for English majors, each with 30 students. Among them, 30 of them have similar professional grade 4 results and use the same teaching material and the same teacher to teach. At the same time, project learning is combined with other teaching methods, so that the characteristics of project learning can be found in the comparison; then two survey questionnaires are issued for the two classes before and after the experiment. The main content of the questionnaire is to investigate students' learning motivation and satisfaction with knowledge. There are 15 questions in total. Each question has 5 options, namely: full approval, approval, uncertainty, disapproval, and complete disapproval, and The option is marked as 5 to 1 points, and then use the calculator or auxiliary statistical software for data statistics; third, the test. A set of papers, which are the knowledge points of the content learned during the semester, has three types of questions: objective multiple choice questions, essay questions, and analytical application questions. Their weights are 30%, 40%, and 30%, respectively. Classes of students complete within two hours. 70% of them are volleyball scores, and the rest are usually scores; fourth, project files. In the research process, project learning documents need to be established, mainly to record student learning, learning logs and project learning, etc., and to make evaluations based on the students’ achievements. Make project results, which should include the strengths, weaknesses, limitations, and areas for improvement of the project; final interviews after the experiment. At the end of the semester, students were randomly selected to conduct audio interviews in the experimental class and questions were asked to the students in advance. The main purpose of this project was to understand the role and effect of project learning in students' English linguistics learning, and to limit the factors of project learning. Higher vocational English teaching design is the key to education concept as the guide teaching reform experience from the focus on innovation teaching "language knowledge" cultivation to pay attention to the language application ability from a "single training mode" to "compound cultivation model of gradual development, guided by the employment of higher vocational education, make higher vocational English teaching with the professional demand as the core asked the students to quickly adapt to the job needs effective will shoulder" practicality "and" professional "combine the use of the language can be incorporated into the cultivation of vocational ability in the process, is the process of higher vocational English course reform practice and development trends. Cooperative learning is a learning method guidance of behaviorism and constructivism theory, based on the theory of the "modern social psychology, educational sociology, cognitive psychology and modern educational technology discipline in the nature of knowledge, knowledge acquisition and the influencing factors of the theory achievement", emphasizes the effect of the collective sense of honor and sense of belonging the construction of knowledge with the way of learning.
The implementation of project learning includes five stages: selecting the main body of the project, formulating the project plan, implementing the project plan, presenting project results, and implementing project evaluation. Throughout the project learning process, students are the main body of learning and teachers are the mentors of project learning. If the position of the role is misplaced, the project will become meaningless. Project learning is divided into four stages, namely: planning stage, implementation stage, summary stage, and demonstration stage. The planning stage is mainly to assign the students a reasonable group, and then select the content that needs to be responsible according to the interest of each group and do a good job of the team division. In the implementation stage, the students divide the work according to the project plan and report the progress of the work to the teacher regularly. At the same time, the problems will not be understood. The teacher communicated in a timely manner and listened to the teacher's suggestions. The summary was mainly to make the written report of the project implementation process to complete the transaction. The demonstration was mainly to explain the whole class in the form of ppt.

Through the analysis of student project files and experimental interviews, we will find that the students’ linguistic exclusion has gradually decreased as the project study progressed, and the motivation for learning has gradually increased. We also found through project learning that the current reason why linguistics is difficult to develop in student learning is that it is less knowledgeable about linguistics, and learning linguistics does not know how to use linguistics to solve practical problems. Therefore, through project learning, they discovered their own problems, deepened their understanding of linguistics, and demonstrated projects in the entire class. They were recognized by teachers and classmates and found that linguistics was not as imaginative as it was difficult to learn. It laid the foundation for students to continue learning linguistics.

3. Conclusion
In summary, we have found that it is not that students are not willing to learn the English linguistics, but that our teaching methods are not suitable for linguistic teaching and that student lose interest in learning. Through research on project learning, we found that project learning can change teachers' traditional education model, pay attention to students as the main body, stimulate students' internal learning motivation, and use various materials and equipment to help students learn English linguistics. However, we also need to realize that the cycle of project study and research is still relatively short, and there are still many problems, especially the transformation of teacher roles and how to communicate with students in project implementation, and how to promote project learning to other disciplines. It also deserves our further study in terms of similar roles in other disciplines. The project learning model can stimulate students' intrinsic motivation for learning English linguistics courses.
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