

Research on the Application of Information Technology Combined with PDCA Cycle in English Teaching

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Abstract: In the present information age, the powerful support and promotion role of information technology for many industries has been recognized by the public. In education, information technology has played a critical role. Information technology has been an effective way to optimize the teaching structure and promote the cultivation of innovative talents. The marriage of English teaching and information technology has become the highlight of education today. The change of teaching methods aims at improving the teaching quality. Integrating the idea of PDCA quality management, carrying out continuous and feasible evaluation and improvement on the application of information technology in English teaching could finally achieve the improvement of teaching quality. Based on the teaching experience, this paper takes the new model English course as an example to explore the feasibility of applying information technology and PDCA to English.

1 INTRODUCTION

Some students' English foundation is relatively weak, and the teaching method adopted by the teachers is relatively simple. It is not easy for students to form a strong interest in English, and there is not much interaction between students and teachers in the classroom teaching process. The improvement of teaching quality has been a difficult problem for a long time. Under the background of the new curriculum standard, the continuous deepening of teaching reform makes the above problems more obvious, and the innovation of teaching mode and the optimization of teaching methods become more urgent.

2 THEORETICAL STUDY RELATED TO INFORMATION TECHNOLOGY AND PDCA CYCLE

2.1 Information Technology

Introduction to information technology. Information technology is also called technology, which is the knowledge and ability to collect, analyze, process

and use information. It covers many technologies, including communication, multimedia and so on. The integration of information technology and English teaching, that is, the application of information technology to English teaching, is to use information technology with computers and networks as the core as an auxiliary tool to combine English teaching with computer technology, making it the main means of learning for students.

2.2 PDCA Cycle

The meaning of PDCA and the feasibility of its application. PDCA, also called Deming ring, was proposed by Americans. It belongs to the procedure that quality management needs to follow. The whole process of quality management activities, that is, the process of determining the quality plan and achieving it by the organization. This process is continuously operated according to the PDCA cycle. PDCA is an abbreviation, where P is the abbreviation of plan, D is the abbreviation of do, C is the abbreviation of check, and A is the abbreviation of action. Plan generally refers to the determination of the scheme, objectives and the practical scheme of activities. Do refers to actual execution. Check refers to summarizing the implementation results, determining the effects and finding problems. Action generally refers to

adjusting the check, carefully recording what is correct and summarizing what is wrong, finding the crux of the problem, and correcting it in the next cycle. PDCA is widely used, which is essentially a theoretical abstraction (Cheng 2022).

2.3 The Application of Information Technology and PDCA Cycle in English Teaching

The significance of information technology fusion PDCA cycle in teaching. A teacher's job is like a designer. To design the communication between

teaching content and teaching, we should also design the way to use teaching resources scientifically, and set up the feedback channel of teaching effect, so as to optimize the teaching plan. Compared with the teaching of other subjects, English should pay more attention to interaction. In addition to teachers and students, students also need to interact. In other words, interaction faces many demands, including timeliness and multi-level. Through information technology, we can create more ways to achieve, but how to make good use of this technology? This paper integrates PDCA management ideas to escort the improvement of English teaching effect.

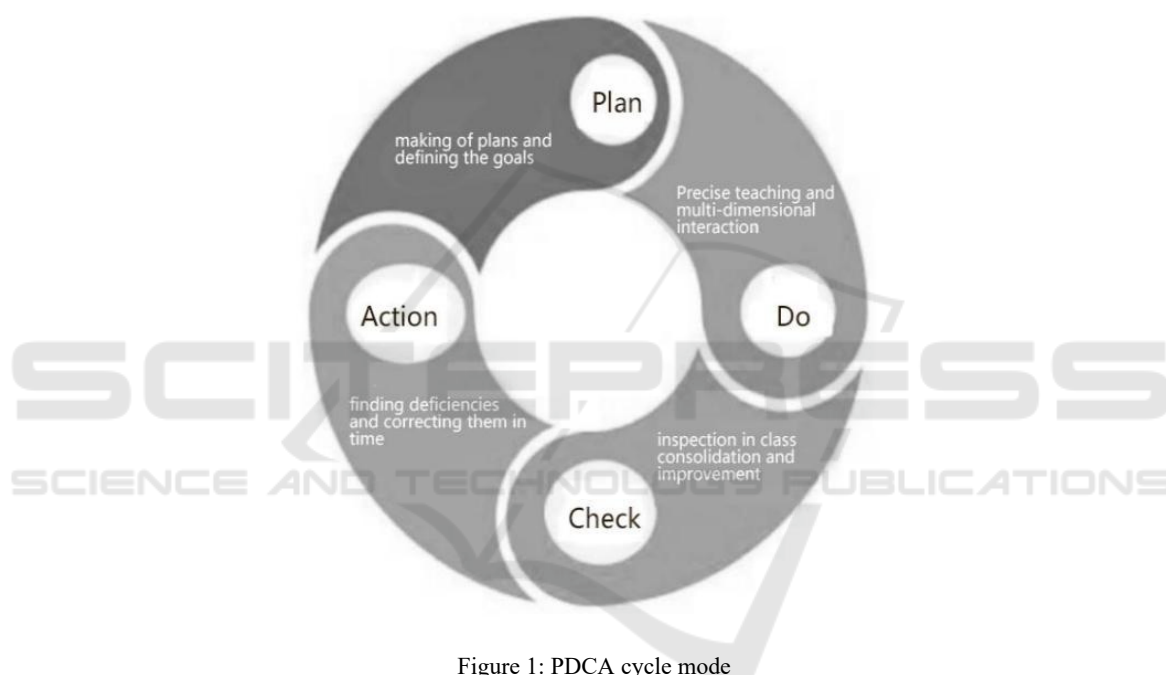


Figure 1: PDCA cycle mode

3 MODEL DESIGN OF ENGLISH TEACHING SYSTEM BASED ON INFORMATION TECHNOLOGY

The IT-based teaching system is a multi-functional integrated application system that realizes networking and informatization of IT daily teaching behaviors, realizes learning across time and space, and it provides a convenient and efficient interaction platform for teachers and students. The system is designed with two roles according to the users, one is the teaching management platform for teachers and the other is the learning platform for students.

The former is mainly for teachers to use the computer network for teaching, so as to realize the sharing of information resources and information resources; the latter is mainly for students to use the computer network for independent learning in the learning process (Dan 2021).

Although the system has different operation privileges for users with different identities, their application functions are interdependent and inseparable, and are classified from the perspective of application functions, which contain the main functional modules as shown in Figure 2.

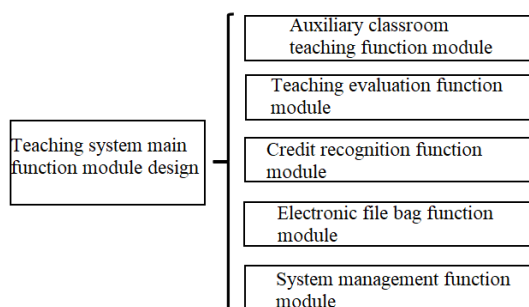


Figure 2: The main functional module design of teaching system

4 EXPERIMENTAL RESEARCH

PDCA cycle is an effective teaching mode, which has great practicability. Combining it with information technology and applying it in teaching can promote the teaching effect. However, in the specific application, we should not only implement the work of relevant links, but also implement the connection between processes to ensure that the cycle can be generated. English is a key course, which has a great influence on the future development of students (Song 2021). Therefore, the application of PDCA teaching mode in teaching and the combination with information technology is powerful measures to comply with teaching reform, and have a far-reaching impact on the optimization of education quality and the development of education industry.

4.1 Experimental Design

Before the implementation of teaching activities, having effective plans provides a good direction for teaching. 1) Evaluation of teaching objects. If we want to teach students in accordance with their aptitude, we should implement the evaluation of students' relevant conditions, including cultural quality and learning ability. Some students in English teaching have a relatively weak English foundation. Compared with their actual majors, English classes are more distant with daily life and their learning enthusiasm is lower. In addition, the teaching methods in the past were relatively boring, which led to exclusion in learning. Figure 3 shows the distribution proportion of students' English scores in a survey. 2) Selection of teaching materials. There are many majors in the school, and there are also many corresponding English classes, such as auto repair and hotel. In this regard, it is

necessary to implement a good plan in combination with the professional situation of the class. Even if the same textbook is used, the chapters learned should be different. Therefore, in the plan link, we should master the professional information of the class. In view of the similarities and emphases of various majors in teaching, for example, the teaching contents of cooking and hotel majors have similar needs in the food theme, but the housing theme does not need to be developed in the cooking class. 3) Courseware and classroom design. For the relatively common situation, that is, the introduction of new courses, there may be a large amount of information at this time. To reduce learning resistance, intuitive teaching methods should be adopted. Intuitively speaking, it means that you can see and touch the course contents through videos and pictures. From the beginning, multimedia tools are combined in the courseware setting, such as Authorware software. Through its guidance and design, courseware with prominent points and embedded videos and pictures can be made (Xie 2022). This courseware can also add interactive scenes, so that students can receive information at multiple levels in class.

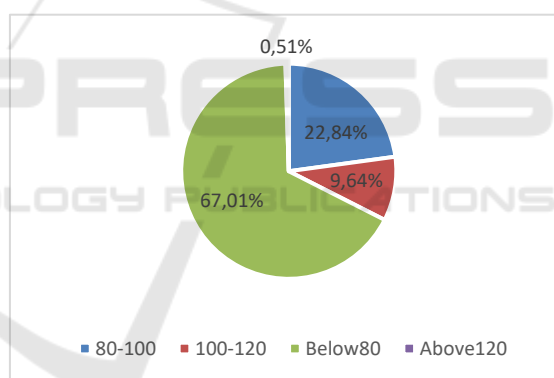


Figure 3: Distribution proportion of students' English scores

4.2 Experimental Procedure

This link is the process of achieving the pre class planning link. 1) During class explanation. With the help of multimedia, we can carry more information, turn language learning into animation appreciation, and get twice the result with half the effort. For example, when explaining the front desk service of the hotel, you can show the dialogue of the reception by videos, concretize the abstract knowledge, and avoid forming a resistance to learning. 2) During the after class guidance, Teachers can guide them to preview, consolidate and expand with the help of Internet knowledge in combination with specific

needs, such as downloading learning software from the Internet to enable them to have sufficient learning resources (Chen 2021). For example, downloading English songs and popular movies, and frequently used English short sentences can not only stimulate their enthusiasm for learning grammar, but also help consolidate their learning. For example, through e-mail to carry out cultural exchanges with foreign friends, improve students' communication awareness and ability. Figure 4 shows the statistics of students' online purposes.

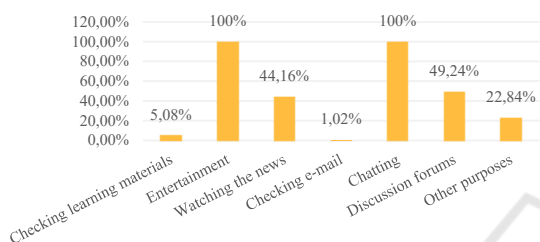


Figure 4: Statistics of students' online motivations

4.3 Experimental Results and Data Analysis

1) Check stage. At the end of the class, students can not only complete the process of collecting timely classroom feedback, but also master the key points. This stage often uses the functions in the slide, that is, custom actions, to effectively complete a question and answer.

2) Action stage. This link is to process the information fed back from the inspection link, affirm the ideal feedback, analyze the actual problems in the next cycle and determine and implement the actual improvement plan for the ones that have not received considerable response.

Empirical analysis: PDCA cycle is a systematic project mode that embodies the management law and introduces the feedback principle in the process of all-round quality management. It belongs to the cycle system of standardization and rationalization

of quality management. It was first proposed by American experts and involves many stages and steps. Table 1 shows the four stages and eight steps of the PDCA cycle. PDCA cycle = plan + do + check + action is now vigorously promoted in enterprise quality management. In recent years, PDCA cycle mode has been used for reference and combined with information technology in English teaching, achieving ideal results. Details are as follows: (1) Teaching object. Teaching objects: 200 students of grade 2022 in a school were randomly divided into two groups, one is the experimental group (Class A) and the other is the control group (class B). (2) Method. The control group adopts the past teaching mode to carry out teaching and assessment, that is, teaching, practice and assessment. The experimental group was taught according to PDCA mode. 1) Analyzing the current situation, finding problems and making plans (P). The teaching and research office and teachers participated in the research of problems in teaching and learned that students' initiative in learning English was low and their grades were lower than those of other subjects. According to the questionnaire, the factors leading to these problems are as follows: Insufficient teaching ability and lesson preparation time. Insufficient teacher training and incentive mechanism. Some students do not pay attention to English, and their learning autonomy is poor. The curriculum design is not scientific enough, and the supporting teaching materials are not in place. Plato conducted in-depth analysis on these problems, as shown in Figure 5. According to the information contained in the figure, the proportion of teaching ability is about 3%, the proportion of teacher training is about 7%, the proportion of lesson preparation time is about 10%, the proportion of teacher motivation is about 13%, the proportion of students who do not pay attention to it is about 14%, the proportion of low learning autonomy is about 16%, the proportion of imperfect curriculum design is about 18%, and the proportion of insufficient supporting materials is about 19%, The cumulative percentage is 100%.

Table 1: 4 stages and 8 steps of PDCA cycle

P stage	1. Investigate and observe, study the situation of students and find problems;
	2. Analyze the causes of influence based on the problems;
	3. Find out the reasons that affect learning;
	4. Determine plans and activities based on core factors.
D stage	5. Implement according to the plan.
C stage	6. Check the specific implementation results in combination with the plan requirements.
A stage	7. Summarize according to the inspection and standardize the successful experience;
	8. Study the problems encountered in teaching and optimize the next PDCA cycle.

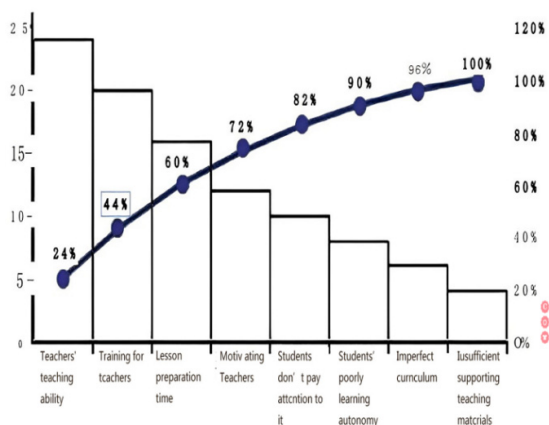


Figure 5: The problems in Teaching of Plato

In view of the above problems, we should improve and set up the constituent elements of the English teaching process, and carefully formulate the teaching plan. First, the evaluation of teaching objects. Before formal English teaching, carry out all-round analysis and measurement of students' relevant conditions, including their acceptance ability and style of study. Second, the selection of teaching materials. In combination with the training objectives and the actual situation of students, the corresponding textbooks were selected and the outline was defined. Third, the training and selection of teaching. First of all, the teaching and research office arranges teachers to study, delves into textbooks, formulates classroom, classroom and chapter objectives, and deeply understands the connotation and quality requirements in combination with the outline, training requirements and basic information of English teachers in the school (see Figure 6). Secondly, teachers are arranged to give trial lectures, and then teachers are selected according to the results of the trial lectures. Finally, organize observation teaching and skill competitions to strengthen the teaching skills of educators. Fourth, clarify the teaching plan. Implementing the teaching plan and preparing the class is the beginning of PDCA cycle. Teachers prepare lessons in combination with the syllabus and students' reality, assess the results of lesson preparation through the teaching and research office, and then arrange collective lesson preparation to finally produce a teaching plan, which involves many elements, such as teaching objectives, focuses and methods.

malc	6	20.69%
fcmalc	23	79.31%
master	1	3.45%
undergraduate	15	51.72%
spcialty	13	44.83%
Deputy senior	2	6.90%
Secondary school level 1	21	72.41%
Secondary school level 2	2	6.90%
No titlc	2	6.90%

Figure 6: Basic information of English teachers

According to the plan, implement the teaching process and achieve the goal. In the specific implementation, according to various text types, the situational teaching method is used as a guide, and then combined with the actual content of the text, the subject and cultural knowledge are infiltrated, so as to mobilize students' enthusiasm for learning and guide their active thinking. And according to the target teaching method, gradually achieve the relevant teaching content. 3) Check. After implementing the scheme, check the completion status of the goal and correct the deviation at the first time. According to the relevant teaching theory, carry out the measurement of learning achievements and give feedback on the completion of learning objectives in an all-round way. The actual practice is: for diagnostic evaluation, it is carried out in the classroom introduction link; for productive evaluation, various methods are adopted in teaching, including questions, reports and demonstrations; summary evaluation is carried out in the middle and end of teaching. In addition, based on collective lesson preparation and lesson evaluation, teachers' teaching methods and achievements are fed back at the first time. 4) Action. Carefully study and deal with all the information obtained from the inspection link, affirm the good experience, generate personal fixed teaching methods and models, and popularize and apply them in future teaching. In view of the shortcomings, we will analyze and determine the relevant rectification measures in depth, and implement them in determining the teaching plan when we enter the next cycle [Hu 2021].

(3) Effect. Table 2 shows the comparison between the English test results of group A and group B students and the English band-pass test results. According to the information contained in the table, the number of students in class A is 150, the mid-term test compliance rate is between 77.8% and 82.8%, the final test compliance rate is between 82.85% and 88.35%, and the band-pass test compliance rate is 100%. The number of students in

class B is also 150, the rate of reaching the standard in the mid-term examination is between 66.2% and 70.8%, the rate of reaching the standard in the final examination is between 68.1% and 73.1%, and the rate of passing the grade examination is 80%. (4) Experience. The application of information technology combined with PDCA theory in English teaching is characterized by the management of

teaching with the help of this theory, so that all links in teaching can be carried out comprehensively according to the four stages, that is, plan, implement, check and process, which highlights the integrity and uninterrupted nature of the teaching process. It makes the teaching work more reasonable and standard, and avoids the arbitrariness and blindness of teaching.

Table 2: Comparison of English test and passing test results of students in group A and B of grade 2022 in a school

Experimental teaching object	Number	Passing rate of midterm examination (%)	Pass rate of final examination (%)	Passing rate of CET (%)
Test group (shift a)	150 people	80.3±2.5%	85.6±2.75%	100%
	150 people	68.5±2.3%	70.6±2.5%	80%

5 CONCLUSIONS

For the combination of information technology and PDCA, that is, to enrich teaching methods and broaden teaching ideas through this technology. It is carried out comprehensively according to the stages of PDCA, including planning, implementation, inspection and adjustment, so as to avoid blindness and arbitrariness in teaching, so that the improvement of teaching effect can be followed by rules, and English teaching can truly create benefits for students.

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