

Research on the Integration Advantages of Modern Multimedia Technology under the Mathematical Statistics Law

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Abstract. With the rapid development of modern science and technology, all kinds of computer network and multimedia technology have entered the classroom teaching, the new type of modern multimedia technology's teaching methods has applied rapidly in countrywide scope. The disadvantages of traditional English teaching methods and application prospects of modern multimedia technology teaching are an objective analysis, the superiority of deep analysis of modern multimedia technology in English teaching, to carry out the effect of English teaching demonstration under the combination of the two, and eventually to arrive teaching effect significant at the teaching methods, which can effectively improve the learner's learning level, learning concept and teaching workers' teaching strategy.

Introduction

With the rapid development of the society, foreign language learning environment has not quite the same compared with the last century and even a few decades ago, which presents a multi perspective, integrated, open form for English teaching. The integration of English teaching and modern multimedia technology is a very popular topic, and many English educators also make certain research in the field, such as Fu Xiaoda and Fu Xiaofan wrote the advantages of multimedia technology in the application of English teaching, which was the analysis of the media technology presents the diversification teaching, it can effectively stimulate students' English learning interest, to improve teaching efficiency [1]; Yuan Huaping and Yu Zhe wrote the multimedia technology in the application of English teaching, it mainly elaborated multimedia aided teaching that has gradually become the modern teaching means, compared with traditional English teaching, it had great advantages that can effectively promote the English teaching reform [2]; Wang Yuzhen's modern multimedia in the application of English teaching was mainly aimed at middle school English education analysis of the use of multimedia to create learning situation, the media can be understood as a tool means in teaching, and had the important tool of traditional teaching thought [3]; Wu Yang wrote the university English listening, speaking and teaching based on multimedia resources, which emphasized on the use of multimedia technology for the positive impact on college English listening, speaking and teaching, it was reform and the innovation of English listening, speaking and teaching, which can make the university English unity that had positive effect on English listening, speaking and teaching, to offer extremely advantageous new teaching direction [4].

Teaching application of modern multimedia technology

The integration of English teaching and modern multimedia technology can be effective implementation of the subjectivity of students' ability in classroom teaching, the multimedia technology provides a graphical image, audio and video and other digital information that can be rich listening, speaking and teaching's content, but also provides rich and colorful English learning environment for learners. In order to better exploring, the teaching application of modern multimedia technology carries out an open investigation in a very wide range, and high school students of the entire school conduct a questionnaire survey [5,6]. In English learning, it is the key to understanding the students on the application view of modern multimedia technology teaching, after the questionnaire survey were completed, taking a random sample statistic randomly selects 1000 as the sample on 5000 questionnaires, wherein each age is 200 to carry on statistics. The current students

are interested in the teaching application of modern multimedia technology as shown in table 1; its different grades' students show not the same enthusiasm [7].

In Table1, its statistic shows that the interest rate of current students on the teaching application of modern multimedia technology is not related to age, only 10% students of 16-18 aged feel in general, 90% of students like; more than prefer students in 19-21 years old classmates has achieved 95%, the number of very hate students are 0; more than prefer students in 22-24 years old are also accounted for more than 92.5%; more than prefer students in 24-26 years old students are more than 95% . Therefore, the integration of English teaching and modern multimedia technology is very popular with the students.

TABLE I. Level of current students' interest for the teaching application of modern multimedia technology

Ages	Very much		Prefer		General		Unlike	
	Number	Ratio	Number	Ratio	Number	Ratio	Number	Ratio
16-18	100	50%	80	40%	20	10%	0	0%
19-21	125	62.5%	65	32.5%	10	5%	0	0%
22-24	115	57.5%	70	35%	15	7.5%	0	0%
24-26	130	65%	50	30%	20	5%	0	0%

According to the survey, the integration of English teaching and modern multimedia technology is very popular with the students. In the process of teaching, it can break the limit of traditional teaching space, time and information quantity, to optimize the development of the students' learning thinking. At the same time, it can be rapidly and timely feedback students' learning information conversion speed, to effectively improve the students' comprehensive quality, and can create a learning environment that is conducive to learning English atmosphere, which can arouse students' learning enthusiasm and initiative, and enhance interaction between English teachers and students. The integration of English teaching and the modern multimedia technology not only inherits traditional teaching mode, but also supplements and improves on the resources environment of modern English teaching, which have a broad space development in this area [8,9].

Advantage analysis of modern multimedia technology in English teaching

Modern society is the parallel era of economy and information, the continuous development of information technology provides new opportunities for the current education, but also provides a new challenge. In the application of the field of education, modern information technology provides new facilities for English teaching, especially the rapid development of multimedia technology in today. The integration of English teaching and modern multimedia technology brings new reforms for the development of English teaching, practice has proved that the application of multimedia technology can change the traditional English teaching's learning environment, to promote the current English teaching transformation, teaching subject, teaching content, teaching mode, teaching idea, teaching system etc [10].

The integration of English teaching and modern multimedia technology can achieve the functional conversion of teachers and students, to better reflect the subjectivity of students that can effectively promote the students' personalized English learning. The teaching process of multimedia technology combined with English teaching is not limited to the contents of textbooks, teaching contents also can be enriched, using information media cooperation teaching, and making many departments multimedia technology have become student subject learning and English learning cognitive means. In the process of teaching, the use of teaching coefficient's complex decision judges the integration fitting degree of English teaching with modern multimedia technology, measuring k variables are explained by the variation in the proportion of total variation after it is fitting multiple regression equation, to represent fitting effect of English teaching and modern multimedia technology. The use of R^2 expresses English teaching complex coefficient of determination, which is used to distinguish it from the students' learning outcomes, to judge the coefficient of determination r^2 . The fitting determination coefficient of English teaching and the modern multimedia technology is defined as:

$$R_{Y.12...k}^2 = \frac{\sum(\hat{Y} - \bar{Y})^2}{\sum(Y - \bar{Y})^2} = 1 - \frac{\sum(Y - \hat{Y})^2}{\sum(Y - \bar{Y})^2} \quad (1)$$

In formula (1), the adjusted correlation determination coefficient can effectively stabilize equation's the number of independent variables on the end fitting effect, the formula of adjusted multiple determination coefficients is:

$$R_{Y.12\dots k}^2(\text{adj}) = 1 - \frac{\sum (Y - \bar{Y})^2 / [n - (k + 1)]}{\sum (Y - \bar{Y})^2 / (n - 1)} = 1 - \frac{S_{Y.12\dots k}^2}{S_Y^2} \quad (2)$$

In formula (2), because the calculation of English teaching and the modern multimedia technology's fitting determination coefficient only carry out in regression equation, so it must use the regression coefficients to calculate $S_{Y.12\dots k}^2$ and S_Y^2 , then to get $R_{Y.12\dots k}^2(\text{adj})$. Namely the need of unadjusted formula calculates the fitting determination coefficient of English teaching and modern multimedia technology, which is expressed as:

$$R_{Y.12\dots k}^2 = 1 - \frac{(n - k - 1) S_{Y.12\dots k}^2}{(n - 1) S_Y^2} \quad (3)$$

In formula (3), according to the unadjusted determination coefficient formula (1), it can carry out multiple regression calculation, which is as follows:

$$R_{Y.12\dots k}^2(\text{adj}) = 1 - \frac{n - 1}{n - k - 1} (1 - R_{Y.12\dots k}^2) \quad (4)$$

In formula (4), multiple correlation coefficients are got by English teaching and modern multimedia technology that must carry out the square of fitting determination coefficient. In multiple regressions, the covariant relation of inherent independent variables and condition variables appear uncertain situation that may be either positive or negative, the multiple correlation coefficients as a description of the amount of all variables covariant relationship, which can only be taken as.

$$R_{Y.12\dots k} = \sqrt{R_{Y.12\dots k}^2} \quad (5)$$

Multiple correlation coefficients can also be used the following formula:

$$\begin{aligned} R_{Y.12\dots k} &= \sqrt{\frac{b_1(\sum X_1Y - n\bar{X}_1\bar{Y}) + b_2(\sum X_2Y - n\bar{X}_2\bar{Y}) + \dots + b_k(\sum X_kY - n\bar{X}_k\bar{Y})}{\sum Y^2 - n\bar{Y}^2}} \\ &= \sqrt{\frac{\sum b_j(\sum X_jY - \frac{\sum X_j \sum Y}{n})}{\sum Y^2 - \frac{(\sum Y)^2}{n}}} \quad (j=1,2,\dots,k) \end{aligned} \quad (6)$$

In formula (6), its calculation results with calculating the fitting determination coefficient between English teaching and modern multimedia technology, which are the same from the theory, however its calculation process is different, just the mantissa of the regression coefficients would have some access. According to the formula, it can be obtained by the fitting determination coefficient of English teaching and modern multimedia technology, thus to judge the integration fitting degree of English teaching and the modern multimedia technology in the teaching process.

Compared with traditional teaching, modern multimedia technology has obvious advantages in English teaching, the modern multimedia technology can be connected to the internet, which can greatly integrate the teaching resources, the efficient use of network can access to more teaching resources, and the use of multimedia technology (text, images, video, sound and sound effects) can be constructed English teaching environment. The English environment can use multimedia technology to construct the teaching need of real scene, which can be maintained and recorded, and not subject to time and space constraints. Sharing platform can be quickly shared with students in English teaching resources, breaking the inherent relation between the teachers and students, effectively to reflect the subjectivity of students, a plurality of interactive stimulate students' interest in English learning, the use of multimedia can make teachers and students to carry on research study, or to carry out collaborative learning. In the process of teaching, the application of multimedia technology can be effectively train students' English reading ability, writing ability, translation ability, speaking ability, application ability, learning ability, comprehension ability and writing ability etc. General speaking, the integration of English teaching and modern multimedia technology have brought unlimited vigor and vitality for English teaching, which has an irresistible prospect and great teaching advantage.

English teaching effect empirical under modern multimedia technology integration

Under the integration of modern multimedia technology, English teaching is generally welcomed by teachers and students, which changes the traditional teaching methods that are dominated by teacher, namely according to the curriculum and teaching plan step by step initiative to instill, students are passive absorption of English knowledge in the process of English mechanical teaching, it is difficult to motivate learning interest, divergent student's thinking, and improve the academic performance of students.

In the universal application of the classroom, modern multimedia technology causes the change of traditional teaching mode and “domination” role of teachers. In the process of teaching, the use of 2011 grade students as the research object, in which selects three classes (class 1, class 2 and class 3) as the experimental class, and three class (class 4, class 5 and class 6) as the reference class, three classes of students carry out a semester of English teaching and modern multimedia technology’ integration teaching in the spring; in addition three classes of English majors, English teaching still uses the traditional English teaching methods, the students distribution is shown in Table 2.

TABLE II. Research object distribution table

Class / Gender	Experimental class		Class / Gender	Reference class	
	Male	Female		Male	Female
Class 1	27	33	Class 4	33	27
Class 2	29	21	Class 5	29	31
Class 3	31	29	Class 6	28	32

In Table 2, the number of experimental class and the reference class is same, and the distribution of male and female is equal. At the same time, the six classes are carried out unified diagnostic test before placement, the performance of three classes is basically same, and its specific results are shown in Figure 1.

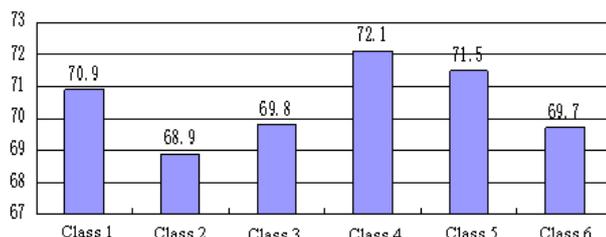


Figure 1. The average statistics of experimental class and reference class in diagnostic test scores

In Figure 1, the average value of experimental class and reference class in diagnostic test scores is not difficult to find, the diagnostic test scores of six classes are basically 70 minutes and are fluctuations in the 3-point range, it can describe that English learning achievement is considerable as the students of study object, so English teaching demonstration has certain scientific under the integration of modern multimedia technology. The six classes’ students as study object carry out teaching for a semester, and the experimental classes take the integrated instruction of English teaching and modern multimedia technology, the reference class in English teaching still uses the traditional English teaching methods to carry on teaching. Each month, teaching effect uses the coordinate association statistic, the coordinate parameters depend on the completion of English test time and a specified time to obtain result that is:

$$Z_{(i, j)} = T_{(i, j)} + C_{(i, j)} \quad (7)$$

In formula (7), i is the beginning of English test time, j is the time end of the English test, $Z_{(i, j)}$ is to complete the comprehensive parameter of test time and test scores coordinate; $T_{(i, j)}$ is to complete the English test value; $C_{(i, j)}$ is the achievements of value in a specified period of time.

After a semester of teaching statistics, the experimental class takes the integration teaching of English teaching and modern multimedia technology, its teaching results are significantly. After final statistics, the comprehensive parameter chart of test time and test scores coordinate is shown in Figure 2.

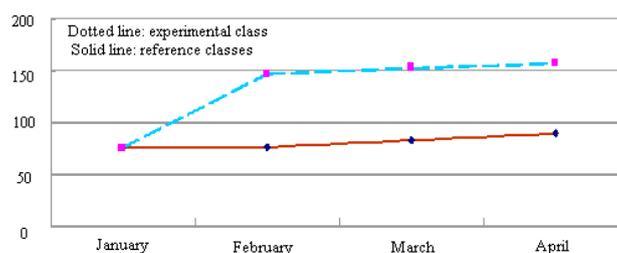


Figure 2. The teaching effect chart of experimental classes and reference classes in a semester

In Figure 2, the teaching results of experimental class are significantly, the completion of test time and the comprehensive parameters of test scores coordinate rise significantly in four times, and the English comprehensive teaching effect of traditional teaching almost does not change significantly, thus further illustrates that the striking effect of English teaching and modern multimedia technology's integration teaching is clear, the modern multimedia technology has great advantage in the application of English teaching.

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With the continuous development of social information and digitization, the modern multimedia technology application scope is also gradually widely, the modern multimedia technology in the field of teaching is increasingly mature, to form complementary relationship compared with traditional education, which plays an extremely important role in the daily teaching. The integration of English teaching and modern multimedia technology has great advantage in the teaching of English, and English educators need to actively explore the new ways and new mode of English teaching, which make a positive contribution for promoting the development of education.

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