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The study of relationship between students' perception to teacher's function and students' English learning achievement on the basis of multimedia application environment

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ABSTRACT

Nowadays, people are paying more and more attentions on education. Our country has done great efforts and developed many new types of education resources on the respect of development of educational technologies, such as multimedia teaching and online education platform and so on. In the new technologies application environment, the teacher's function is more important. This article explained the teacher's function that should have in the multimedia teaching environment first of all, including leading students to autonomously learn, encouraging students to autonomously learn, and resolving students' doubts, fully excavating relative network information and expanding students' knowledge. Then this article talked about the relationship of multimedia teaching technology, teacher's function and students' learning achievement theoretically, and found out that they affected each other and made common process. Finally, it did questionnaire survey about perception to teacher's function in view of college students. And on the basis of the survey results, it classified the surveyed students by the means of BP neuron network. And it respectively studied the students who had negative perception to teacher's function and students who had positive perception to teacher's function as well as the relationship of the two kinds of students' learning achievement and the perception evaluation. At the same time, this article studied the linear relationship between the students' comprehensive evaluation of perception to the teacher's function and students' learning achievement.

KEYWORDS

Multimedia; Teacher's function; Students' perception; BP neuron network; Online education.



INTRODUCTION

With the rapid development of computer technology, computer are playing an important role in people's daily life. Multimedia teaching is one of the production of the development. As a new teaching method, it is inevitable to have some unharmonious factors during the using process. For example, some students do not get used to it. As for those mentioned problems, relative scholars did analysis.

In 2012, He Jing emphasized that the teacher-student relationship of language teaching had badly influence on the study effects of students in < The influence of teacher-student relationship on English learning of middle school students from the angle of hidden curriculum>. Teacher-student relationship is a part of hidden curriculum. Good relationship is benefit to the opening of teachers' work. Author studied the relationship of teacher-student relationship and middle school students' learning achievement through quantitative study and qualitative investigation. After investigating the factors of English teaching teacher-student relationship in middle school period, author found out that most of present teachers focus on classroom teaching and negative the communication with students out of class. Teachers preferred the explanation of English knowledge than the inside communication with students. Author pointed out that there were some correlations among the students' perception to the English teacher and their fondness of English and leaning achievement. The teacher-student relationship is better, the attitude when students ask for help to teacher is better. Author illustrated important precautions to establish good teacher-student relationship from the point of English teachers.

In 2013, sui xiaobing put forward that during the process of the reformation of college English teaching method, online environment college English teaching method can bring both benefits and the questioning from teachers and students because the original balance system of college English classroom was broke in < The study of college English teaching method optimization in network environment-empirical investigation based on Jiamusi University>. In order to solve the problem, author proceeded lots of research and he found out that the main behavior of students were their autonomous learning ability was comparatively weak and they lacked of strategies of acknowledge: the main behavior of teachers were that there was deviation between teaching concept and practical teaching; on the respect of teaching environment, the teaching hardware facilities did not match with reform scheme, and the teaching resources online did not be fully used. So author said the optimization of teaching plan around "students' autonomous learning model, teachers' development and ecological classroom"

In 2014, Wang Zhimin pointed out that learning motivation was the important factor to affect foreign languages learning effect. And student's English basic level also had effect on the inspiration to learning motivation in < The research on the effectiveness of strategies of students' learning motivation inspired by college English strategy teachers >. The text used plenty of study methods and comprehensively analyzed the strategies of teachers to inspire students' learning motivation. The research result showed that different strategies had different effect on different students. So, author put forward the stratified education system. In view of students whose English basic level are different, using different methods to inspire their motivation to make them be real fond of English and to improve their grade.

This article will introduce teacher's function in the multimedia teaching environment, and study the relationship between students' perception to teachers' work and students' learning achievement.

TEACHER'S FUNCTION

Multi-media decreases teachers' work in some degree. But during the process of multimedia teaching, teachers function is more important. In the English teaching, teachers need to organize the class, lead students to autonomous studying, motivating students learn by self, solving students' doubts, excavating full relative online information and expanding students' acknowledge.

(1) Organization the class

English teacher should design reasonable class form according to the teaching content, syllabus and teaching goals under the circumstance to understand students' basic English level and their study abilities to make all od the students can be involved into the class. And during applying multimedia

technology, teachers should choose reasonably the teaching form of multimedia according to the students' situations to avoid making students have resistant to learning.

(2) Leading students' autonomous learning

Multimedia teaching method contains a lot of aspects in where the multimedia online teaching is adopted to students' autonomous learning. Teachers should fully motivate students' interests to use online resources, for example, teachers can recommend English movies, short films and electronic books. Guiding method like these can be easier accepted by students. Meanwhile, those ways can offer students opportunities to learn and explore the world.

(3) Encouraging students learning

In the process of practical teaching, many teachers will find that some students do not know how to study. For example, students have no courage to open their mouths or they have no patience to study English. Under this circumstance, teachers should intervene students' autonomous learning, otherwise it will make consequence of studying blindly. Teachers can encourage students to set their study goal and plan. Teacher also should encourage students to speak when they are studying languages. Teachers can also establish students' debate group to study with each other and guide others to inspire them.

(4) Solving doubts

"Teacher is the person who could propagate the doctrine, impart professional knowledge, and resolve doubts." It is teachers' duty to solve students' doubts. As a teacher, they not only solve students' confusion of basic acknowledge, but also help students resolve their difficulties of learning methods. In that, teachers need to take communication out of class with students, and they can also use emails, weibo, weixin and other online platform to offer online help to students.

(5) Excavator of internet informntion

Nowadays, there are lots of information about English teaching. Teachers always use other's courseware instead of their own courseware that made with their own teaching concept and online information. But the research shows that the courseware made by teachers themselves are much more benefit to the opening of multimedia teaching and the understanding of knowledge. And the effect of students' studying is much better.

THE RELATIONSHIP BETWEEN STUDENTS' PERCEPTION AND LEARNING ACHIEVEMENT

The perception of students has influence on their studying attitude and learning achievement. The perception of students to teachers' work is mainly through the explanation method of teaching, encouraging method and the organization of classroom three ways. And the way of teacher to select and make multimedia courseware is the auxiliary way, as Figure 1.

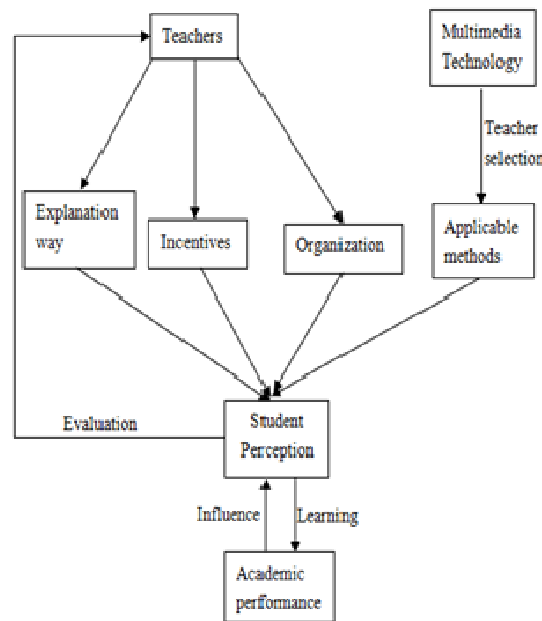


Figure1 : The relationship between the students' perception and learning achievement

From Figure 1, we can see that the perception of students to teacher’s work is from four respects, the explanation way, incentives, organization and applicable methods. And students’ perception and their own studying have common effects on the academic performance. At the same time, the learning achievement also affects students’ perception to teachers’ work.

Case study

In order to study the relationship between the perceptions of students to teacher’s work and students’ learning achievement during the practical teaching process, randomly selecting ten students of high school to evaluate according to perception to explanation way, perception to incentives, perception to organization and perception to applicable methods and the four level grade. Score is centesimal system. The research results are as TABLE 1.

TABLE 1 : Statistic table of students’ perception situation and students’ grades

Number	Perception to explanation method	Perception to incentives	Perception to organization	Perception to applicable method	Grade of four level
1	60	55	70	30	55
2	70	60	60	80	59
3	50	40	55	45	50
4	80	30	70	50	62
5	45	45	80	90	65
6	50	40	60	45	49
7	60	80	75	85	63
8	80	70	85	90	71
9	55	45	50	60	52
10	90	90	70	60	79

Through plenty of reference, we can know that students’ learning achievement has effect on perception of students to teacher’s work. If we want to find out the relationship, first we need to classify students according to the learning achievement.

Classifying according to learning achievement

Doing equalization processing according to the four evaluation situation, the result is called comprehensive evaluation. The result is as TABLE 2. Classifying result with BP neuron network theory.

TABLE 2 : Results of comprehensive evaluation

Number Grades of four level Comprehensive evaluation		
1	55	53.75
2	59	67.5
3	50	47.5
4	62	57.5
5	65	65
6	49	48.75
7	63	75
8	71	81.25
9	52	52.5
10	79	77.5

Calculation steps of BP neuron network model

Neuron network model comes from neurobiology. Its calculation is similar to the biological reaction process of neurons, as Figure 2. In neuron network, many different neurons' axon terminals can enter into the same neuron's dendrite and form a lot of synapses. Neurotransmitters of all synapses of different origins can have effect on changes of membrane potential. So we can know the ability of neuron's to unit space information i.e. neuron can unit different origins input message on dendrites. Based on the ability, people simulated the reaction process of neuron to make artificial neuron model.

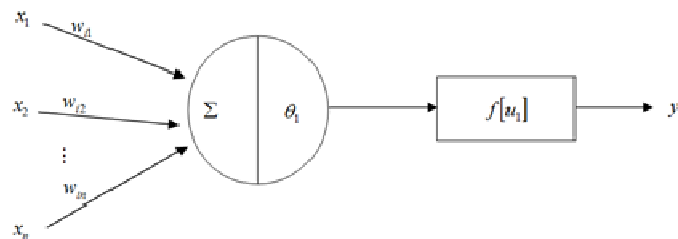


Figure 2 : The schematic of mathematical models of neurons

BP neuron network is a multilayer feed forward network with minimum mean square error. When applying back-propagation algorithm to multilayer feed forward network, using *Sigmoid* as excitation function and using next steps to process recursive calculation to w_{ij} i.e. network weight coefficient. When every layer has n neurons, there are n weight coefficients to layer k , i -th neuron: $w_{i1}, w_{i2}, \dots, w_{in}$. In addition, selecting more one w_{jn+1} to represent θ_i . When input sample x , assumed that $x = (x_1, x_2, \dots, x_n, 1)$.

- Assigning w_{ij} . To w_{ij} of each layer, assigning a smaller non zero random number, as the same time $w_{jn+1} = -\theta_i$. Because this model proceeds with Matlab, the assignment processing is the

computer's random process. So that the same program code in different processing may have different results.

- Input sample $x = (x_1, x_2, \dots, x_n, 1)$, and corresponding exceptional output $y = (y_1, y_2, \dots, y_n, 1)$.
- Calculating every layer's output, to k layer i -th neuron's output x_{ik} :

$$y_i^k = f[u_i^k]$$

Therein,

$$u_i^k = \sum_j w_{ij} x_j^{k-1} - \theta_i^k$$

In the formula, $x_{n+1}^{k-1} = 1$, $w_{i(n+1)} = -\theta$

- Calculating every layer's calculation error, to output layer $k = m$:

$$d_i^m = x_i^m (1 - x_i^m) (x_i^m - y_i^m)$$

To other layers:

$$d_i^k = x_i^k (1 - x_i^k) \left(\sum_j w_{ij} x_j^{k-1} - \theta_i^k \right)$$

- Modifying w_{ij} and θ_i :

$$w_{ij}(t+1) = w_{ij}(t) - \eta d_i^k x_j^{k-1}$$

- After calculating every layer's every weight coefficient, we can know whether it is fit for requires according to the standard criterion. If it is not fit, then going back the third step. Otherwise, ending calculating.

Calculation results

Processing Matlab program to above steps, the results are as Figure 3.

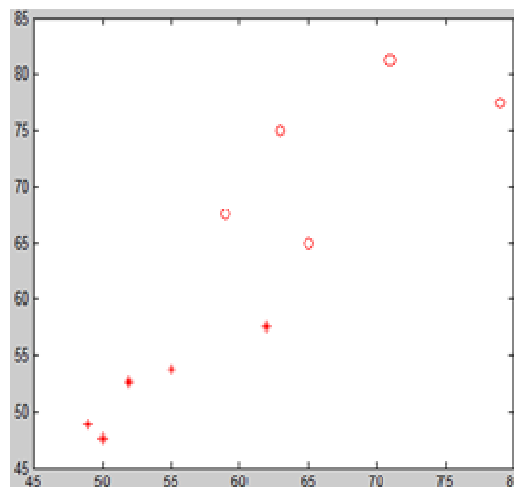


Figure 3 : Classification results

Through Figure 3, we can see that number 2,6,7,8 are the same sort, belonging to the better one. Number 1, 3, 4, 6, 9 belong to the worse sort.

THE FUNCTION RELATIONSHIP

On the theoretical basis of multi linear regression, respectively processing analysis to the two kinds groups. Treating the four level grades as dependent variable y . Multi linear regression analysis model is:

$$\begin{cases} y = \beta_0 + \beta_1 x_1 + \dots + \beta_m x_m + \varepsilon \\ \varepsilon \sim N(0, \sigma^2) \end{cases}$$

In the formula, $\beta_0, \beta_1, \dots, \beta_m, \sigma^2$ are nonrelative parameters to x_1, x_2, \dots, x_m and all are unknown. Therein, $\beta_0, \beta_1, \dots, \beta_m$ are regression coefficient.

Now there are n independent observing data $(y_i, x_{i1}, \dots, x_{im})$, $i = 1, \dots, n, n > m$. From formula (6):

$$\begin{cases} y_i = \beta_0 + \beta_1 x_{i1} + \dots + \beta_m x_{im} + \varepsilon_i \\ \varepsilon_i \sim N(0, \sigma^2), i = 1, \dots, n \end{cases}$$

Written as:

$$X = \begin{bmatrix} 1 & x_{11} & \dots & x_{1m} \\ \vdots & \vdots & \dots & \vdots \\ 1 & x_{n1} & \dots & x_{nm} \end{bmatrix}, Y = \begin{bmatrix} y_1 \\ \vdots \\ y_n \end{bmatrix}$$

$$\varepsilon = [\varepsilon_1 \quad \dots \quad \varepsilon_n]^T, \beta = [\beta_0 \quad \beta_1 \quad \dots \quad \beta_m]^T$$

Formula (6) can also be expressed as:

$$\begin{cases} Y = X\beta + \varepsilon \\ \varepsilon \sim N(0, \sigma^2 E_n) \end{cases}$$

Therein, E_n is n steps unit matrix.

Function relationship of good evaluation

Multimedia teaching has been used for more than one decade, and teachers and students have adjusted to the way of education. The perception of students to teacher's function is changing consistently. Under most circumstances, students of good grade have positive perception to teachers' function. And this kind of students are comparatively cooperated with teachers' work.

Doing regression analysis to students of number 2, 6, 7, 8, 10, through *Matlab* to get:

$$b = (38.0225, 0.5371, 0.0472, -0.2, -0.1281)$$

So we can have the function:

$$y = 38.0225 + 0.5371x_1 + 0.0472x_2 - 0.2x_3 - 0.1281x_4$$

In that, x_1 is students' perception to explanation methods of teachers, x_2 is students' perception to incentives, x_3 represents students' perception to organization of class, x_4 is the perception to multimedia applicable methods.

Function relationship of bad evaluation

When students' perception are bad to teacher's work, they may have resistance to teacher and be not interested to studying.

This is relative to the communication out of class between teachers and students. This situation will take place once teachers and students have less communication.

Doing regression analysis to students of number 1, 3, 4, 6,9, through *Matlab* to get:

$$b = (48.4959, -0.2884, 0.4504, -0.4331, 0.3207)$$

Then we can obtain function:

$$y = 48.4959 - 0.2884x_1 + 0.4504x_2 - 0.4331x_3 - 0.3207x_4$$

x_1 is students' perception to explanation methods of teachers, x_2 is students' perception to incentives, x_3 represents students' perception to organization of class, x_4 is the perception to multimedia applicable methods.

Function relationship of comprehensive evaluation and learning achievement

Treating overall students as object of study, on the basis of TABLE 2, using curve fitting, treating comprehensive evaluation as independent variable and for level grade as dependent variable to study the relationship, with SPSS to get results as TABLE 3.

TABLE 3 : Result of SPSS processing

	Non-standardization coefficient		Standardization coefficient	t	Sig.
	B	SE	Beta		
VAR00002	.689	.125	.889	5.497	.001
(constant)	17.346	7.987		2.172	.062

To compare the functions' fitting similarity, then we can find out that the relationship and linear relationship are the closest of all. So the function is: $y = 0.689x + 17.346$. Therein, y is four level grade, x is comprehensive evaluation.

CONCLUSION

This text focused on studying the relationship between the perception of students to teachers' work and their learning achievement, and gave concrete functions. The conclusion can provide theoretical basis for further opening of teachers' work in multimedia teaching. According to the relationship between students' comprehensive evaluation and their grades, there is proportional relationship between the grades and comprehensive evaluation which is fit for the practical life. And that also means the reasonability of the model.

During the multimedia English teaching from now on, schools should further enhance the input of multimedia relative facilities and teachers should encourage students to study English knowledge autonomously. At the same time, teachers should build harmonious English class atmosphere, inspiring students' studying interests, increasing the communication with students out of class and improving students' perception level to English class so to improve the students' grades.

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