

Application of Multimedia Technology in Situational Teaching of Foreign Language

Zhenhuan Zhang

Institute of Foreign Languages, Handan College
Handan, Hebei, China
E-mail :zzhdjy_2005@126.com

Fengyun Zhao

Institute of Foreign Languages, Handan College
Handan, Hebei, China
E-mail : julia0507@126.com

Abstract —By using digital information, the integration of situational teaching of foreign language and modern multimedia technology enrich the contents of foreign language teaching, which provides a rich and colorful environment for English learners. It can stimulate emotional students' experience and enhance their willing of participating in interacting with classmates. Based on cognition of teaching methods of situational teaching theory, this paper analyzes the advantages of multimedia technology in situational teaching of foreign language, thus deduces applied purpose and principles of it in situational teaching of foreign language by using the mathematical model. It provides the theory basis and new ways of teaching practice for situational teaching of foreign language.

Keywords—multimedia; foreign language; situational teaching; model building; analytic function

I. INTRODUCTION

As an important tool of teaching and communication, multimedia information technology promotes the improvement of teaching skills of teachers. With the popularization of modern education, rapid development of teaching level and dramatic changes of teaching methods, traditional teaching idea and limited knowledge cannot meet the require of the teaching situation at present[1,2]. With the development of the information technology, the application of multimedia technology in teaching has been paid more attention especially in situational teaching of foreign language, such as problems existed in multimedia teaching of college English and its countermeasures of Wang Xuehua and Zheng Yuqi, it analyses the problems and countermeasures while teaching, and effectively directs the problems of situation creation of college foreign language teaching; the review and consideration of multimedia teaching of Zhang Jun, it makes great contribution for many aspects like enhancing the study of theory, building correct teaching idea and dealing with the relation of teaching as well as strengthening realization of teaching design; the study of teachers' skills of multimedia teaching in colleges, it investigates and analyses the teaching skills of teachers in colleges, and establishes the relation between informational and technical skills of teachers and teaching skills by discussing the background of the study, provides improved strategies for further developing informatization teaching. With the rapid development of the society, foreign language learning environment has not quite the same compared with 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; 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 to promote the English teaching reform; 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; 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 them [3,4]. It can make the university English unity that offer extremely advantageous new teaching direction.

II. COGNITION OF TEACHING METHODS BASED ON SITUATIONAL TEACHING THEORY

Situational Language Teaching was called Oral Approach at the beginning. It was popular in UK during the 1950's, with the development of the globalization culture, Situational Language Teaching was spread in all over the world. It was found that the main theory basis of Situational Language Teaching is mainly based on three educational theories, as shown specifically in the following Figure.

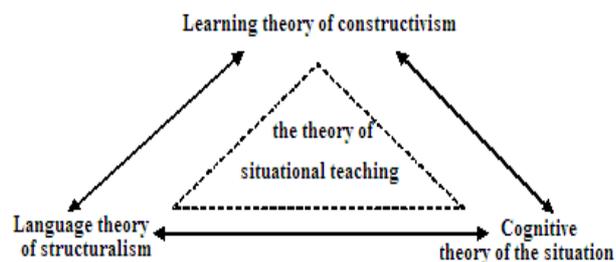


FIGURE I. SUPPORTS OF THE THEORY OF SITUATIONAL TEACHING

As shown in Figure 1, supports of the theory of the situational teaching are learning theory of constructivism, cognitive theory of the situation, and language theory of structuralism. Integrate plenty of learning resources that emphasized by constructivism and creative situation learning, combine the key element of utterance of structuralism and cognitive theory of the situation, underline the important role of language in situational education, the perfect organic combination of situational environment and language structuralism treats environment as a vital component of teaching process, it contacts closely with the whole teaching process, analyses the differences of students, thus conducts diversified teaching, meets requirements of students.

Situational Language Teaching originated from English teaching at first in China, it is also applied in other subjects. The core of situational teaching is tightly closed to the content of courses in no matter what subject, creating a situation to help students digest content of courses and deepen the effect of learning. Situational Language Teaching has following Figures, the below Figure shows the specific organizational process [5].

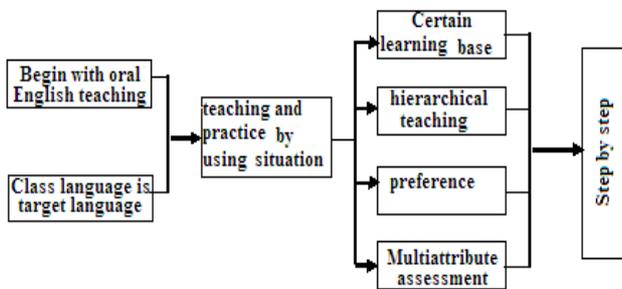


FIGURE II. ORGANIC PROCESS OF SITUATIONAL LANGUAGE TEACHING

III. ADVANTAGE ANALYSIS OF MULTIMEDIA TECHNOLOGY IN SITUATIONAL TEACHING OF FOREIGN LANGUAGE

Modern society is the parallel era of economy and information, the development of information technology provides new opportunities and challenge. Practice has proved that the application of multimedia technology can change the traditional English teaching's learning environment and teaching system etc [6].

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. 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 variables are explained by the variation 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 follows:

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

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 [7]:

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

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 $R_{Y.12 \dots k}^2 (adj)$. Namely the need of unadjusted formula calculates the fitting determination coefficient of English teaching and modern multimedia technology, which is expressed as [8]:

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

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

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

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 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:

$$R_{Y_{12} \cdot k} = \sqrt{\frac{b_1(\sum X_1 Y - n\bar{X}_1 \bar{Y}) + b_2(\sum X_2 Y - n\bar{X}_2 \bar{Y}) + \dots + b_k(\sum X_k Y - n\bar{X}_k \bar{Y})}{\sum Y^2 - n\bar{Y}^2}}$$

$$= \sqrt{\frac{\sum b_j(\sum X_j Y - \frac{\sum X_j \sum Y}{n})}{\sum Y^2 - \frac{(\sum Y)^2}{n}}} \quad (j = 1, 2, \dots, k) \quad (6)$$

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.

Compared with traditional teaching, modern multimedia technology has obvious advantages in English teaching. The English environment can use multimedia technology to construct the teaching need of real scene. 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. In the process of teaching, the application of multimedia technology can be effectively train students' ability in English reading, writing, application comprehension, and etc. Thus the integration of English teaching and modern multimedia technology have brought unlimited vigor and vitality for English teaching.

With the development of social informatization and digitization, the application of multimedia technology in teaching domain has become mature, and it makes positive attribution to pushing the development of education career. Media is the platform of information spreading, and the characteristics of multimedia technology aided teaching are showed by the following Figure.

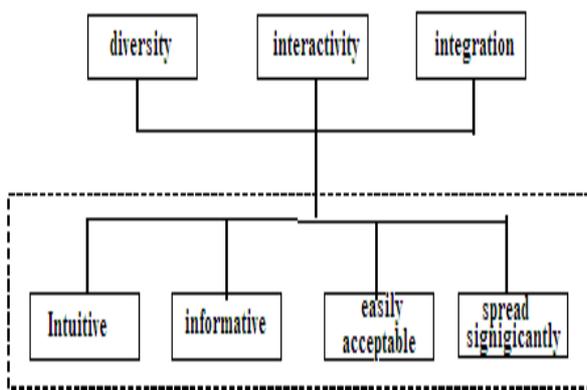


FIGURE III. THE CHARACTERISTICS OF MULTIMEDIA TECHNOLOGY AIDED TEACHING

As Figure3 shown, the inherent of media characteristics of multimedia technology aided teaching present diversification teaching, it can stimulate the learning interest of students, improve the efficiency of teaching.

The integration of English teaching and modern multimedia technology can make functionality transition between teacher and student happen. The application of multimedia technology in situational teaching of foreign language can define them as two entity function, set multimedia technology as function φ , situational teaching of foreign language as entity function ψ , the advantages of multimedia technology in foreign language confirm the inner product of the two entity function is projection product, specific analysis is multiplying the relative value of function and then integrating in domain, so the whole expression is:

$$\langle \varphi, \psi \rangle = \int_{\Omega} \varphi \psi \, d\Omega \quad (7)$$

Taking the complex number φ of multimedia technology as function and the complex number ψ of foreign language as entity function, with the revolution of the way of modern teaching, information technology certainly will be applied in teaching of all sorts of subjects, so one must take a conjugate among the two of the following formula:

$$\langle \varphi, \psi \rangle = \iiint_{\Omega} \varphi \psi^* \, d\Omega = \iiint_{\Omega} \varphi^* \psi \, d\Omega \quad (8)$$

In the application of practical teaching link, situational teaching of foreign language based on information technology should absorb the advantages of multimedia and traditional teaching to achieve better teaching effect, the norm of multimedia technology as a function can be constructed:

$$\|\varphi\| = \sqrt{\langle \varphi, \varphi \rangle} \quad (9)$$

The teaching process of combining multimedia technology and foreign language teaching is not limited in the content of teaching material, the information media can become an approach of cognition apart from topicality learning and foreign language learning of students. The inner product of multimedia technology as function φ and situational teaching of foreign language as entity function ψ is the multiplex, therefore it is called φ and ψ as orthogonality, that is:

$$\iiint_{\Omega} \nabla \cdot (u \nabla v) \, d\Omega = \iint_{\Gamma} u \nabla v \cdot \overline{d\Gamma} \quad (10)$$

Γ is the boundary of Ω . Unfold the left side of the equal sign, it can be concluded[9]:

$$\iiint_{\Omega} u \nabla^2 v \, d\Omega + \iiint_{\Omega} (\nabla u) \cdot (\nabla v) \, d\Omega = \iint_{\Gamma} u \frac{\partial v}{\partial n} \, d\Gamma \quad (11)$$

$$\iiint_{\Omega} v \nabla^2 u \, d\Omega + \iiint_{\Omega} (\nabla v) \cdot (\nabla u) \, d\Omega = \iint_{\Gamma} v \frac{\partial u}{\partial n} \, d\Gamma \quad (12)$$

The application of multimedia technology in situational teaching of foreign languages can break the limit of space, time and information of traditional teaching, optimally extend learning mind of students, and improve the comprehensive quality of students effectively, on this account, subtract two formulas (11) (12), it comes to [10]:

$$\iiint_{\Omega} (u \nabla^2 v - v \nabla^2 u) d\Omega = \iint_{\Gamma} \left(u \frac{\partial v}{\partial n} - v \frac{\partial u}{\partial n} \right) d\Gamma \quad (13)$$

The integration of foreign teaching and modern multimedia technology is not only an inheritance of traditional teaching method, but also a complement and improvement of resources environment of modern English teaching, it has a wide development space in the domain.

IV. THE APPLICATION TARGET AND PRINCIPLE OF MULTIMEDIA TECHNOLOGY IN SITUATIONAL TEACHING OF FOREIGN LANGUAGE

The application of multimedia technology in situational teaching of foreign language mobilizes learning enthusiasm, initiative of students, and strengthens the interactivity between English teachers and students [11]. The main application targets are as follows, the following Figure has shown specifically.

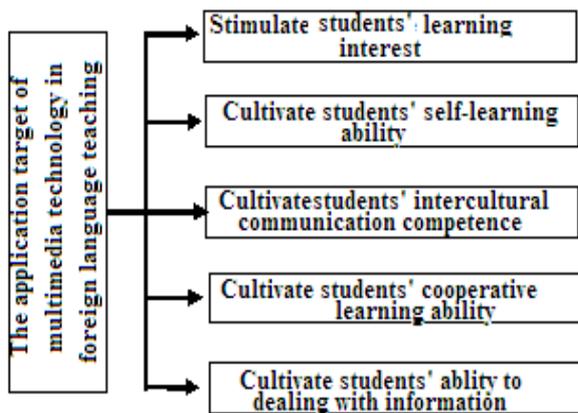


FIGURE IV. THE APPLICATION TARGET OF MULTIMEDIA TECHNOLOGY IN FOREIGN LANGUAGE TEACHING

As shown in Figure 4, the application of multimedia technology in situational teaching of foreign language should have the five targets above, multimedia technology is on the basis of the production and development of cognitive theory of the situation, aiming to promote communication through creating appropriate situation, truly understanding the learning objective law of students.

To construct the architecture of solving teaching problems scientifically and effectively through a serious deep cognition, pay more attention to stimulating the interests of learning foreign language of students, suppose the demand function of interest is $u = f(x)$, map the element X that influences the stimulation of interest during the class of situational teaching to the element u of the class of situational teaching;

take the cultivation of ability as a key point of the whole cultivation of teaching, build the demand function $I = I(u)$ of ability cultivation, map the element u that influences the cultivation of ability during the classes of situational teaching to the element I during the classes of situational teaching; take the information processing as the core of foreign language situational class teaching, build the demand function $g = Au$ of information processing, map the element u that influences information processing during situational teaching classes to the element g of situational teaching classes. When the operation which is presented by A acts on the function u , Au and u are both belonging to function space; so A is called operator, the interactive element of multimedia technology, the element of analogue function, the element of teaching situation are content with the operator of linear operation law, they are called linear operators[12]:

$$\begin{cases} A(u_1 + u_2) = Au_1 + Au_2 \\ A(a_1u_1) = a_1Au_1, \quad a_1 \end{cases} \quad (14)$$

Or presented as: $A(a_1u_1 + a_2u_2) = a_1Au_1 + a_2Au_2$, a_1 and a_2 are constant, that is certain principles, the specific requirement is to make situational teaching of foreign language moves toward to optimization, make progress of new revolution of reaching during teaching links, the following Figure2 shows the specific principles.

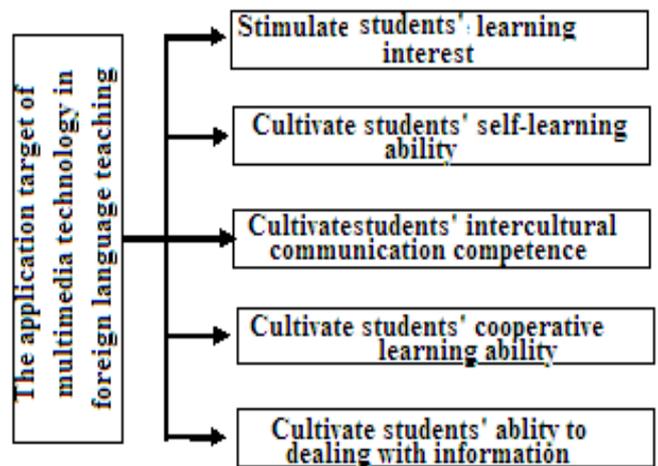


FIGURE V. THE APPLICATION PRINCIPLE OF MULTIMEDIA TECHNOLOGY IN SITUATIONAL TEACHING OF FOREIGN LANGUAGE

As the Figure5 shown, the application of multimedia technology in situational teaching of foreign languages has bi-directional nature, they reflect a relationship of integration,

multimedia technology is need when developing the thinking ability of students during the process of situational teaching of foreign languages. It not only uses multimedia technology as new teaching media in the process of teaching, but also integrates all sorts of organic elements, so the six principles which are showed in Figure5 need to be paid attention.

V. CONCLUSION

Combined with practical teaching process, this paper analyzed the characteristics of multimedia technology, constructed the model of informatization teaching through analyzing the pros and cons of multimedia technology in English situational teaching. It also studied the impact and influence of multimedia teaching and its development tendency from the current situation of the development of it. The authors tried to explore the problem that used information technology to guide teaching practice and put forward efficient solutions, which is the centre that workers in that field should pay attention to.

ACKNOWLEDGMENT

The paper is one of the research findings of the Handan College project of teaching reforms in 2012 “The application research on the informatization of foreign language teaching promoted by the modern educational technology” (research number: HDJG12034).

REFERENCES

- [1] Shu-Chiao Tsai, Developing and integrating courseware for oral presentations into ESP learning contexts , *Computers & Education*, Vol. 55, No. 3, 2010, pp.1245-1258.
- [2] Daniel C. Moos, Elizabeth Marroquin, Multimedia, hypermedia, and hypertext: Motivation considered and reconsidered, *Computers in Human Behavior*, Vol.26,No.3, 2010, pp. 265-276.
- [3] Aliana Man Wai Leong, Jacky Xi Li, A study on English teaching improvement based on stakeholders' needs and wants: The case of the Faculty of International Tourism of the Macau University of Science and Technology (MUST) , *Journal of Hospitality, Leisure, Sport & Tourism Education*, Vol.11, No.1, 2012, pp.67-78.
- [4] Shu Ching Yang, Yen-Fen Huang, A study of high school English teachers' behavior, concerns and beliefs in integrating information technology into English instruction, *Computers in Human Behavior*, Vol.24, No. 3, 2008,pp.1085-1103.
- [5] Ivan Lombardi, Not-so-Serious Games for Language Learning. Now with 99,9% More Humour on Top , *Procedia Computer Science*, Vol.15, No.7,2012, pp.148-158.
- [6] Yuping Wang, Nian-Shing Chen, Mike Levy, The design and implementation of a holistic training model for language teacher education in a cyber face-to-face learning environment, *Computers & Education*, Vol.55, No.2, 2010, pp.777-788.
- [7] Nilcan Ciftci Ozuorcun, Feride Tabak, Is M-learning Versus E-learning or are They Supporting Each Other? *Procedia - Social and Behavioral Sciences*, Vol. 46, 2012,pp.299-305.
- [8] Daniel A. Guttentag, Virtual reality: Applications and implications for tourism , *Tourism Management*, Vol.31,No. 5, 2010, pp. 637-651.
- [9] Mengxiang Li, Chuan-Hoo Tan, Hock-Hai Teo, Kwok-Kee Wei, Effects of product learning aids on the breadth and depth of recall, *Decision Support Systems*, Vol.53, No.4, 2012, pp. 793-801.
- [10] Gemma Corbalan, Liesbeth Kester, Jeroen J.G. van Merriënboer, Selecting learning tasks: Effects of adaptation and shared control on learning efficiency and task involvement, *Contemporary Educational Psychology*, Vol.33,No. 4, 2008, pp. 733-756.
- [11] anis A. Cannon-Bowers, Clint Bowers, Katelyn Procci, Optimizing Learning in Surgical Simulations: Guidelines from the Science of Learning and Human Performance, *Surgical Clinics of North America*, Vol. 90, No. 3, 2010, pp.583-603.
- [12] Wade J. Mitchell, Chin-Chang Ho, Himalaya Patel, Karl F. MacDorman, Does social desirability bias favor humans? Explicit-implicit evaluations of synthesized speech support a new HCI model of impression management , *Computers in Human Behavior*, Vol.27,No.1,2011,pp. 402-412.