



# Research on the Mode of Language Ability Cultivating Using Multiple Regression Analysis

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**Abstract.** With the development of cultural innovation, social communication has put forward new requirements on language ability. In this paper, we have explored the mode of cultivating language ability based on multiple regression analysis to improve teaching so that more language professionals can be trained. In order to quantitatively test the effect of language ability training under cultural innovation, we built the detection statistics and judgment criteria, combining with the fuzzy correlation control method, and carry out self-adaptive evaluation simulation analysis of the cultivation effect. SPSS19.0 statistical analysis software was used to evaluate the effectiveness of language use development and the results of the sampling of big data statistical analysis were obtained. Based on the big data statistical analysis, the effectiveness of the language ability training model was evaluated. The results showed that the model can effectively analyze the effect and has a high accuracy of quantitative assessment. In the context of cultural innovation, the ability of language use needs to be improved correspondingly, and it is difficult to adapt to the traditional training mode. Thus, the new training mode is adopted so as to improve language ability.

**Keywords:** big data · language ability · training model · Recurrence Quantification Analysis (RQA)

## 1 Introduction

The ability to use a language refers to language proficiency, which is based on rich vocabulary and correct grammar. Language is not only a tool for communication, but also a form of cultural expression. In modern society, the development of culture is changing rapidly, and culture innovation brings about changes to the way of language communication, expression skills and vocabulary application [1]. It is an important research topic in language teaching to adapt to the trend of cultural innovation and explore the training model of language ability which adapt to the requirements of the times. In this paper, we analyzed the requirements of language ability in the new era and had a clear understanding of the changing trend of language ability. An assessment model for language ability has been put forward to test the effect of the new training mode, with the purpose of promoting teaching in language ability.

## 2 An Analysis of the Economic Effect of Cultural Innovation

The degree of cultural innovation can measure the level of industrial structure as well as comprehensive economic strength of a country or a region. The social value of language indicates that language cannot only bring great economic benefits to micro-subject, but also have a positive impact on the economic and social development [2]. A country's national language skills can create favorable conditions for economic and social development and enhance international competitiveness and influences. Cultural innovation can promote the application of language, and language innovation, in turn, can bring opportunities to economic development [3].

### 2.1 The Relationship Between Cultural Innovation and Economy

The relationship between cultural innovation and economy is inseparable. Cultural innovation is a prerequisite for economic activities, and the rapid development of economy will promote cultural innovation. Figure 1 is a schematic diagram of the proportion of cultural industries in the GDP of China from 2012 to 2017.

It can be concluded from Fig. 1 that the cultural industry value added in 2012–2017 has a sustained growth, with the same growing pace with China's GDP. Thus, the two show a positive correlation.

### 2.2 Contribution Ratio of Cultural Innovation to Economic Growth

Cultural innovation has certain economic effects and can affect the level of economic growth, specifically in promoting GDP growth and employment. According to statistics, the added value of China's culture and related industries accounted for 4.2% of GDP in 2016, which shows that the cultural industry has been further promoted as a strategic pillar industry.

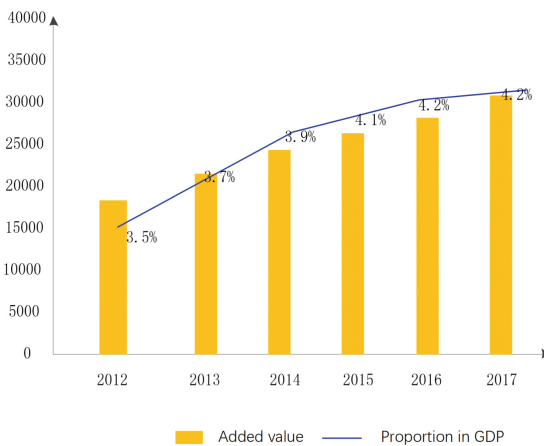


Fig. 1. Proportion of value added to GDP of cultural industries (Edited by the author)

The model of China's creative index is a professional model to evaluate the competitiveness of cultural industries. The model has been tracking and evaluating the competitiveness of the cultural industry of China's large and medium-sized cities for many years. The evaluation data shows that the greater the CCCI, the stronger the competitiveness of cultural industries. According to the assessment results, Beijing, Shanghai, Hong Kong, Shenzhen, Hangzhou and Guangzhou ranked top six in the competition of cultural industries. The model showed that four of the six ones had a CCCI value of more than 80 points, of which Beijing and Shanghai were more than 90 points, the top two, followed by Hong Kong and Shenzhen. Hangzhou, with a score of 76.73, ranked fifth, followed by Guangzhou with a score of 75.23. The six cities are ranked the "first-tier" because of their high scores. East China is classified as the "second-tier" and south China the "third-tier". By comparison, the CCCI value of the first-tier is 20.29 and 26.6 points higher than that of the second and third tier, respectively. The data also reflect the higher economic benefits of cultural innovation in more economically developed regions [4].

### **2.3 Requirements of Cultural Innovation on Language Ability**

According to the above analysis, cultural innovation plays a key role in economic development, and language as part of cultural innovation should also be highlighted. The use of language needs to have innovative characteristics, reflect the connotation of the times and inherit traditional culture. Cultures are experiencing changes and innovation with the development of society. Thus, language use also needs innovation, which is essential for social development. Secondly, the use of language must proceed from the reality, with the purpose of solving all kinds of problems in our lives. And this is the embodiment of epochal connotation. Third, language use must be based on excellent traditional culture [5].

## **3 Exploration of Cultivation Mode for Language Ability Based on Cultural Innovation**

In the current teaching model, the language major on the language application ability cultivation has many problems, which is not enough to cultural innovation understanding, the cultural innovation environment language application ability of the new requirements of understanding is not deep, in this environment, the students will be language application ability cannot meet the needs of the society. In view of this, it is imperative to explore new cultivation mode [6].

### **3.1 Take Traditional Culture as the Basis of Language Learning**

The relationship between traditional culture and language is inseparable. Traditional culture is the survival basis of language, while a language was born with a certain cultural background. Language is the carrier for culture communication and can bring cultural prosperity. In the current social background, the worldwide exchange is increasingly frequent, with rich communication channels and high-efficiency dissemination. Thus, the interaction of culture is also increasing. Chinese traditional culture is facing the erosion

of foreign culture, especially Western culture, with its strong ability of infiltration. As a generation undertaking the task of national rejuvenation, it is our unshakable responsibility to inherit traditional Chinese culture. In the cultivation mode of language ability, taking the traditional culture as the basis of language learning, is a better inheritance of traditional culture, and can carry on the traditional culture in the process of language learning. Traditional culture is the basis of language, and traditional culture can help get a better understanding in language. Taking traditional culture as the basis of language learning is an indispensable important content in the new cultivation mode of language ability [7, 8].

### **3.2 Enriching the Connotation of Language Use with Frontier Culture**

The development of cultural innovation will inevitably produce new ways of language expression. The development of culture can enrich the language environment, and change the use of words, grammar and context. Not only culture but the use of language needs innovation. Every natural person who lives in social life cannot do without the use of language. As a social communicative way, language usage runs through the life of human beings. The cultivation of language usage ability plays an important role in whether the language is successfully established in society. Cultural innovation and development produce frontier culture, while frontier culture is the latest expression of culture, representing the new height of cultural development. During New Democracy, the revolutionary culture was the frontier culture, which led the social development at that time, and also created the foundation for Baihua (vernacular literature). In the modern world, culture develops more rapid, and social progress is reflected in full. Frontier culture needs to be expressed with new language. The application of frontier culture to enrich language can help enrich the use of language [9].

### **3.3 Take the Essence and Discard the Dregs**

Culture should be developed in the process of innovation. However, some uncivilized culture such as school bullying and cyberbullying is born with this process. There are many reasons for these dregs, two of which are most important. First, the teaching system is not perfect. Codes on campus behaviors and culture construction of campus are not specific and irregular. The second one is the influence of pluralistic culture in society. These dregs culture is like a tumor buried in the body of every student. They can erode their souls and seriously affect the physical and mental health of teenagers at any time. Therefore, the dregs must be promptly removed. In the context of cultural innovation, colleges and universities are required to discard the dregs to prevent the harm on students and create a healthy campus environment for students [10].

## **4 Modeling and Analysis of Application Effect of Cultivation Mode of Language Ability**

An evaluation model of training effect of language application ability was proposed based on multiple regression analysis under the cultural innovation perspective, and

the detection statistics and decision criteria were established under the constraints of association rules. The model is:

$$\begin{cases} b_{20}(t; \lambda) = \frac{1}{2}(1 - \lambda t)(1 - t)^3 \\ b_{21}(t; \lambda) = \frac{1}{2}[1 + (\lambda + 3)t - 3(\lambda + 1)t^2 + 4\lambda t^3 - 2\lambda t^4] \\ b_{22}(t; \lambda) = \frac{1}{2}(1 - \lambda + \lambda t)t^3 \end{cases} \quad (1)$$

To determine the tight relationship of language application ability training in the perspective of cultural innovation, in the high-dimensional distribution space of features, the variables of cultural innovation in the perspective of language application ability training effect evaluation are defined as  $Z_i(i = 1, 2, \dots, 8)$ ; From the perspective of cultural innovation, the distribution set of characteristics for evaluating the effects of language application ability training is defined as  $W_{ki}(i = 1, 2, \dots, 6; k = 1, 2, \dots, 6)$ ; From the perspective of cultural innovation, the similarity characteristics of the training effect of language application ability are defined as  $X_{ij}(i = 1, 2, \dots, 6; j = 1, 2, \dots, 8)$ . By analyzing the above-mentioned constraint parameter model, a multiple regression analysis model for evaluating the effect of language application ability cultivation from the perspective of cultural innovation is constructed:

$$\begin{aligned} EST_1(v_i, p_q) &= \max_{v_j \in prnt(v_i)} \{p\_available(q), \\ &EFT(v_j, p_m) + k \cdot C(v_j, v_i)\} \end{aligned} \quad (2)$$

Dynamic game theory was used to analyze the linkage mechanism of the evaluation of the training effect of language application ability under the cultural innovation perspective.

$$p(y|\alpha, \theta) = \sum_{k=1}^K \alpha_k p_k(y|\mu_k, \sum k) \quad (3)$$

The Eigen decomposition method is used to obtain the eigenvalues of the effect of cultivating language ability:

$$\Delta d = \frac{1}{2} \times t \times u \times \sum_{i=1}^t \sum_{j=1}^u \left\| \bar{d}_i - M\hat{d}_i^j \right\|^2 \quad (4)$$

The positive correlation optimal decision-making model for the evaluation of the effects of language competence cultivation from the perspective of cultural innovation is described as follows:

$$\max_{x_{a,b,d,p}} \sum_{a \in A} \sum_{b \in B} \sum_{d \in D} \sum_{p \in P} x_{a,b,d,p} V_p \quad (5)$$

$$\text{s.t.} \quad \sum_{a \in A} \sum_{d \in D} \sum_{p \in P} x_{a,b,d,p} R_p^{bw} \leq K_b^{bw}(S), b \in B \quad (6)$$

Therefore, the distribution set of statistical characteristics of the effects from the perspective of cultural innovation is calculated. Under the regression analysis model, the optimization modeling of language application ability training effect evaluation from the perspective of cultural innovation is realized [11].

### 5 Empirical Analysis and Test

In order to quantitatively test the effect of language ability training under cultural innovation, we built the detection statistics and judgment criteria, combining with the fuzzy correlation control method, and carry out self-adaptive evaluation simulation analysis of the cultivation effect. SPSS19.0 statistical analysis software was used to evaluate the effectiveness of language use development from a cultural innovation perspective, and the results of the sampling of big data statistical analysis were obtained, as shown in Fig. 2.

Based on the data of Fig. 2, the effectiveness of the language ability training model was evaluated from the perspective of cultural innovation, and the evaluation results were shown in Fig. 3.

Figure 3 shows that the model can be used to analyze the effect of language training from the perspective of cultural innovation, and the accuracy of quantitative evaluation

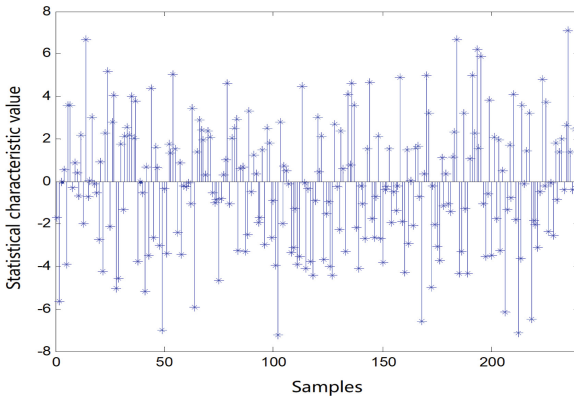


Fig. 2. Big Data sampling (Edited by the author)

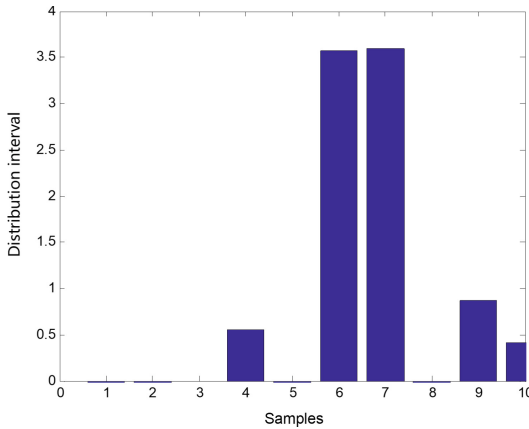


Fig. 3. Assessment results (Edited by the author)

is high. In the context of cultural innovation, the ability of language use needs to be improved correspondingly, and it is difficult to adapt to the traditional training mode. Thus, the new training mode is adopted so as to improve language ability.

## 6 Conclusion

This paper explores the training mode of language application ability based on big data analysis from the perspective of cultural innovation to promote the training of language professionals and improve teaching work. By analyzing the requirements of cultural innovation on language application ability, we know that the development of cultural innovation will change the language expression, put forward higher requirements on language application ability, and explore the language application ability training mode based on cultural innovation. An evaluation model of the training effect of language ability based on multiple regression analysis was proposed, and the detection statistics and decision criteria were constructed. Then, the adaptive evaluation of the training effect of language application ability was conducted by combining fuzzy correlation control method. The result of empirical analysis shows that the model can effectively analyze the effect of language application ability training from the perspective of cultural innovation, and the accuracy of quantitative evaluation is high.

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## References

1. CHEN X Y. Focusing on the text, focusing on language usage—Discussion on the development of language skills in the teaching of reading. *HuaXia JiaoShi*. 2017, 23(5): 27–28.
2. HU Y X. Research on Foreign Language Ability of Cross-border E-Commerce Talents in Higher Education Institutions in the Era of “Internet Plus”. *New curriculum research*. 2017, 5(5): 25–26.
3. WU M J. Study on how to develop students’ language skills in the teaching of reading. *Inner Mongolia Education*. 2016, 19(30): 65.
4. DENG J X. A Probe into the Cultivation of Language Ability in Language Teaching. *Language Planning*. 2017, 9(14): 73–74.
5. LI M. Analysis of mode of cultivating English language ability in the foreign communication of tea culture. *Tea in Fujian*. 2017, 39(7): 374–375.
6. ZHANG Y J. Research on implementation effect evaluation model of emergency plans based on multi-level and grey evaluation method. *Journal of Xiangtan University (Natural Science Edition)*. 2017, 39(1): 3312–3315.
7. HUA B, MU L X, ZHAI H Y, et al. Evaluation Method of Water Flooding’s Effect in Oil Fields Based on Radar Charts. *Bulletin of Science and Technology*. 2017, 33(2): 56–60.
8. LI X Y, LI H Y, ZHANG L, et al. Design and Implementation of High-speed Railway Transport Capacity Evaluation System. *Railway Transport and Economy*. 2018, 40(4): 42–47.

9. LI L B, AN Z T, YANG P. Design of elderly capability assessment system based on Android. *Modern Electronics Technique*. 2018, 515(12): 183–186.
10. ZHANG X S, WANG H J, MA F, et al. Method to assess recoverable tight oil based on multiple regression analysis. *Oil & Gas Geology*. 2018, 39(06): 241–253.
11. YU J X. Mathematical Model of Low Calorific Value of Coal Washing Based on Multiple Linear Regression Analysis. *Coal Technology*. 2017, 36(7): 287–289

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