



## Factors on Bilingual Teaching Effect on the Course of “Introduction to E-commerce”

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### ABSTRACT

Under the background of education modernization, construction of bilingual teaching courses in colleges and universities is directly driven by project of undergraduate teaching quality and teaching reform launched by the Ministry of Education, and has been expanding rapidly. This paper, takes the course of “introduction to e-commerce” as an object, measures the bilingual teaching effect from the four aspects, namely teachers’ professional capacity, teachers’ foreign language capacity, students’ learning motivation and suitability of teaching materials. The results of the study show that, students learning motivation, teachers’ professional capacity and teachers’ foreign language capacity significantly impact the bilingual teaching effect of “introduction to e-commerce”. Therefore, colleges and universities should actively guide students to interest in learning, stimulate students’ learning motivation, improve teachers’ foreign language level and enhance their professional quality, so as to improve the bilingual teaching effect of the course.

**Keywords:** bilingual teaching, introduction to e-commerce, teaching effect, structural equation model

### INTRODUCTION

In recent years, the Ministry of Education has paid more and more attention to bilingual teaching in undergraduates’ teaching quality and teaching reform. Many universities in China have started bilingual teaching practice. Bilingual teaching refers to the teaching of specialized courses conducted by a teacher in the classroom using both mother tongue and a certain foreign language to enable students to think, study and communicate by two languages at the same time. There are many factors that influence the effectiveness of bilingual teaching. Though a substantial number of scholars have made some research on it, they still fail to form a systematic understanding.

“Introduction to e-commerce” is the basic course for the majors of economics and management in universities. Based on years of teaching practice of this course with bilingual teaching, in this paper, the author tries to take the opportunity of the bilingual teaching reform of this course, using empirical methods to explore the factors such as professional level of teachers, teachers’ foreign language level, students’ learning motivation and

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#### **State of the literature**

- The effect of bilingual teaching is influenced by many factors. This paper is based on the course of “introduction to e-commerce” with a perspective on micro level, rather than the perspective on some specific major or macro perspective on a certain subject, so the conclusion would be limited to the effect of the course by bilingual teaching.
- As the limitations of data acquisition, the sample of this paper is only the students from the authors’ university, without any students from other universities, so the representativeness of samples should be further improved.

#### **Contribution of this paper to the literature**

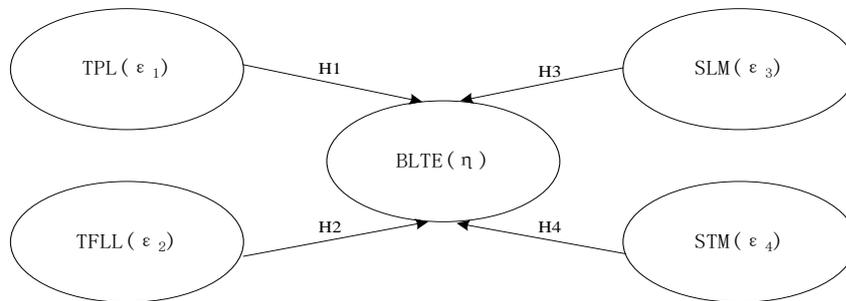
- Creatively constructed a scale for measuring bilingual teaching effectiveness
- Carried out the empirical analysis by using the scale with Structural Equation Model
- Drew the conclusion that universities should focus on student’s learning motivations and teachers’ quality.

appropriateness of teaching materials in the hope of distinguishing the key factors that influence the effect of bilingual teaching, so as to improve the course’s teaching quality.

### LITERATURE REVIEW

Some countries like The United States, Canada and Australia have rich experience in bilingual teaching as well as the theoretical research on bilingual education (Zhang Xianhua, 2012; Altinay-Gazi and Altinay-Aksal, 2017). However, in Europe and the United States, bilingual teaching focuses more on elementary education, our higher education in the bilingual teaching is more similar to Europe’s bilingual courses, or specialized courses teaching in English (Huang Chongling, 2008; Cai and Youngblood et al., 2017).

In China, scholars have paid more attention to the effect of bilingual teaching in the last ten years. Liu et al. (2006), by using questionnaires, proposes the suggestions to improve the effect of bilingual teaching from the factors of the psychological preparation for bilingual course, language preparation, professional knowledge preparation, textbooks’ selection, the proportion of bilingual teaching, course scheduling and stimulation of students’ interests. Pan (2007) believes that the target orientation of bilingual courses, the students’ English foundation and the diversity of bilingual course assessment methods affect the enthusiasm of both teachers and students, thus affecting the teaching quality. In addition, she also mentions factors such as the proportion of English teaching, the school management system and teachers’ foreign language proficiency impact the bilingual teaching effect. Yu et al. (2009) proposes the specific implementation process to improve the bilingual teaching effect for the course of “supply chain and logistics management” from the aspects of teaching materials’ selection, teaching contents’ arrangement, teaching methods’ selection, teaching resources integration and combination of various teaching methods. Wu (2012) uses 25 variables in structural equation model and concludes that five factors significantly affect the level of insurance professional bilingual teaching: teaching system, teachers’ level, students’ level, textbook with original edition and teaching environment. Wang et al. (2012) uses structural equation model and verified the teacher’s professional level, the teachers’ foreign language level, the students’ motivation and willingness to learn foreign language were positively influenced the bilingual teaching effectiveness on e-commerce major. Zhang (2012) adopts content analysis method for part of variables in Colin Baker bilingual education pattern. She refines 6 first level indicators (teaching team, teaching content, teaching methods, teaching resources, policy support and teaching effect) into 11 second ones. With quantitative analysis of these indicators, she concludes the general level of demonstration course conducted by the Ministry of education. Liu et al (2012) do the teaching experiment comparing bilingual classes with classes teaching with single language by interactively feedback teaching system and results that students’ study foundation and attitude treating the bilingual teaching are the most fundamental factors influencing the teaching effect. Yan et al (2013) evaluates the teaching quality of bilingual courses in colleges from the aspects of teachers’ quality, students’ quality, teaching process, teaching management system and teaching effect. Zhang et al. (2013) and Liu (2017) makes the statistical analysis from three aspects of



**Figure 1.** Factors model for bilingual teaching effect on the course of introduction to e-commerce

Notes: TPL: Teachers' Professional Level  
 TFLL: Teachers' Foreign Language Level  
 SLM: Students' Learning Motive  
 STM: Suitability of Teaching Material  
 BLTE: Bi-Lingual Teaching Effect

teachers, students and teaching materials by Hierarchy Analysis and comes to the conclusion that teaching mode, coverage of English in teaching and students' English level were significantly influence the bilingual teaching effect. Yang (2016) finds that professional knowledge and English proficiency are the main constraints on bilingual course teaching in international economics. Zhang et al. (2016), through investigation and empirical analysis, concludes that bilingual teaching resources and students' learning attitude are the two main factors influencing the effectiveness of bilingual teaching.

The above research has a certain significance on identifying and analyzing factors that affect the effectiveness of bilingual teaching. However, many shortcomings have exposed. First of all, scholars disagree on the influence factors of bilingual teaching. Some cover the curriculum while others cover the major. Secondly, most researches remain in the subjective judgment on research method, failing to verify whether these effects exist or not. Finally, the research content focuses on experiences introduction and ignores theoretical research. This paper, on the basis of practical experience on the course of "introduction to e-commerce", tries to overcome the simplistic tendency of the past studies, proposes theoretical model with hypothesis aiming at the influence factors on the effect of bilingual teaching and carries out empirical research.

## RESEARCH MODEL AND THEORETICAL HYPOTHESIS

This article analyzes the four aspects of bilingual teaching effect on the course of "introduction to e-commerce" from the professional level of teachers, teachers' English level, students' learning motivation and appropriateness of teaching material. The model's framework is shown in **Figure 1**. In this paper, the observation variables of each factor are identified and classified, as shown in **Table 1**, and the following 4 hypotheses are put forward. The structural equation model is used to verify the hypothesis between the above factors.

Hypothesis 1 (H1): Teachers' professional level significantly influences bilingual teaching effectiveness in the course of introduction to e-commerce;

Hypothesis 2 (H2): Teachers' foreign language proficiency significantly influences bilingual teaching effectiveness in the course of introduction to e-commerce;

Hypothesis 3 (H3): Students' learning motivation significantly influences bilingual teaching effectiveness in the course of introduction to e-commerce;

Hypothesis 4 (H4): The appropriateness of teaching materials significantly affects bilingual teaching effectiveness in the course of introduction to e-commerce.

**Table 1.** Factors and variables

<b>Factors</b>	<b>Observation Variables</b>
Bilingual teaching effect	Grasping degree of course's knowledge for students Activeness of class atmosphere Cooperation degree between teachers and students Development degree of students' bilingual thinking
Teachers' professional level	Degree of grasping professional knowledge Demand-meeting of teaching content Attractiveness of the courseware Richness of bilingual teaching method
Teachers' foreign language level	Expression ability of oral English Foreign language proportion in courseware Foreign language proportion in classroom teaching Foreign language proportion in classroom communication
Students' learning motivation	Necessity to learn the course Interests in learning the course Learning purpose of the course Time spent on the course learning
Appropriateness of teaching materials	Price Contents' difficulty Contents' novelty Contents' framework

**Table 2.** Values of variables' Cronbach's  $\alpha$  and explained variables of factors analysis

	<b>Cronbach's <math>\alpha</math></b>	<b>Explanation variance</b>
Teachers' professional level	0.746	57.6%
Teachers' foreign language level	0.851	67.7%
Students' learning motivation	0.903	70.4%
Appropriateness of teaching materials	0.844	58.6%
Bilingual teaching effect	0.913	73.8%

## DESIGN FOR EMPIRICAL RESEARCH

### Reliability and Validity of the Sample

This paper ensures the reliability and validity of the samples in three ways. First, the items of the questionnaire used in this paper are all from the published literature, which many scholars have used the scale in measuring the relevant variables and the corresponding scale has good reliability and validity; secondly, this paper relates to the scale on the basis of the earliest proposed scale and subsequent revision; thirdly, through consulting relevant experts in the field, the pre-survey questionnaire was taken, and after assessing the reasonable degree of the questionnaire, the questionnaire was revised according to the advice provided by the pilots.

### Measures

In view of the above research model and hypothesis, the Likert scale was designed by using 21 observation variables in **Table 1**, and each observation variable scaled from 1 to 5. In this paper, the design of the Likert scale comprehensively considered the previous researches (Pan, 2007; Feng, 2007; Wu, 2012; Wang, 2012; Zhang, 2012; Yan, 2013; Yang, 2016; Zhang, 2016). **Table 1** showed the details of each variable and the corresponding items. The value of variables' Cronbach's  $\alpha$  and explained variables of factors analysis subscale are shown in **Table 2**.

## EMPIRICAL ANALYSIS

### Pre-survey and Data Analysis

In this paper, a convenient sampling method is adopted in investigating the students whose major are accounting or economics who have received bilingual teaching in the course of "introduction to e-commerce". The survey was done by inviting the students to fill out the questionnaires, and 57 copies were sent and successfully collected 44 copies. The effective rate of recovery was 77.2%.

From **Table 2**, we can see that the values of each Cronbach  $\alpha$  are all above 0.7. It can be seen that the scale of this study has good internal consistency reliability. This study examined the construct validity of the questionnaire through exploratory factor analysis. The principal component analysis is used to intercept the data with the characteristic root value above 1, and the orthogonal rotation method is used to do the factor analysis. The result of analysis shows that the KMO value is 0.897, and passes the Bartlett's sphericity test ( $p < 0.000$ ). There are 15 factors whose characteristic root values are above 1, and the cumulative variance interpretation ratio is as high as 74.32%. Except one item whose commonality is above 0.5, all the other items together are above 0.67. So the preliminary judgment of the validity of the questionnaire is good in construction.

Exploratory factor analysis results show that items are better load to each factor with high load coefficient except 4 items. The load coefficient is low for the item of "attractiveness of teaching courseware" in the scale of "teachers' professional level". The scale reliability changes little when this item removed. So, this item is decided to be removed. Similarly, the deletion of the item of "the ratio of foreign language exchange in communications" in the scale of "teachers' foreign level", "the necessity of course learning" in the scale of "students' learning motivation" and "the contents' novelty", "the contents' framework" in the scale of "appropriateness of teaching materials". After revising, we deleted 5 items and got the formal questionnaire with 16 ones. Overall, the questionnaire has an ideal level of reliability and validity.

### Formal Research and Data Analysis

The questionnaire for the formal study was sent to 250 students who had learned the bilingual course of "introduction to e-commerce", whose major was accounting, economics, marketing or tourism management. 223 copies of the questionnaires was recovered in which 216 copies were effective and the effective response rate is 86.4%. LISREL 9.2 is used to analyze the data of formal research by maximum likelihood method.

#### *Confirmatory factor analysis*

Confirmatory factor analysis was used to test the reliability and validity of the formal study. According to the study of Bollen (1989), the complex square correlation coefficient  $R^2$  can be used to test reliability. All the  $R^2$  values in this study are between 0.18-0.70, which indicated that the study has acceptable reliability. In the validity test of the model, this paper first tested the fitting level, as shown in **Table 3**. Generally speaking, the goodness of fit index (GFI), the non-normal fitting index (NNFI) and the comparison fitting index (CFI) range between 0-1, and the closer to 1, the better the fitting effect. The model is better if the absolute fit index ( $\chi^2/df$ ) is less than 3 and the model is acceptable if  $\chi^2/df$  is less than 5, else if  $\chi^2/df$  is more than 10, then the model is not ideal. The value of  $\chi^2/df$  in this research is 2.48, which has reached the desired level, and the root mean square error of approximation (RMSEA) is close to the ideal level of 0.05. The values of other fit index were all above 0.7, of which the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI) were both above 0.8, relative fitting index NFI and NNFI have reached an ideal level of 0.9, while the parsimony standard fitting index (PNFI) was above 0.8. In addition, the fit index of CFI and IFI are both above 0.9. As the above indexes were all within the acceptable range, the model structure is reasonable.

The model validity was tested by factor loading. The variable loadings for confirmatory factor analysis were shown in **Table 3**. The results showed that the values of the standard load coefficient for the observed variables on the corresponding latent variables were below 0.6 and passed the T test except one coefficient. The

**Table 3.** Variable load factor and model fit from confirmatory factor analysis

Latent variables	Observation variables	Standardized coefficient of load	T value
Bilingual teaching effect	BLTE1	0.83	15.08
	BLTE2	0.79	13.86
	BLTE3	0.75	12.34
	BLTE4	0.81	13.11
	BLTE5	0.72	12.23
Teachers' professional level	TPL1	0.63	10.19
	TPL2	0.62	10.03
	TPL3	0.71	14.16
Teachers' foreign language level	TFLL1	0.79	13.78
	TFLL2	0.74	12.65
	TFLL3	0.84	15.46
Students' learning motivation	SLM1	0.81	14.53
	SLM2	0.88	15.37
	SLM3	0.78	13.44
Appropriateness of teaching material	STM1	0.55	8.36
	STM2	0.62	8.10

**Table 4.** Standardized path coefficients, hypothesis testing and goodness of fit of the model

Theoretical hypothesis and path relationship	Standardized path coefficient	T value	Conclusion
Teachers' professional level and bilingual teaching effect H1 $\epsilon_1(\text{TPL}) \rightarrow \eta(\text{BLTE})$	0.218**	2.094	supported
Teachers' foreign language level and bilingual teaching effect H2 $\epsilon_1(\text{TFLL}) \rightarrow \eta(\text{BLTE})$	0.349***	3.066	supported
Students' learning motivation and bilingual teaching effect H3 $\epsilon_1(\text{SLM}) \rightarrow \eta(\text{BLTE})$	0.437***	3.659	supported
Appropriateness of learning material and bilingual teaching effect H4 $\epsilon_1(\text{STM}) \rightarrow \eta(\text{BLTE})$	0.173	1.735	refused

Notes: \* means significance level 0.05; \*\* means significance level 0.01; \*\*\* means significance level 0.001.

coefficient was significant at the level of  $p < 0.001$  and the factor loading of T value varied from 8.10 to 15.08. This showed that all variables in this study have sufficient astringency in validity.

### *Model structure analyzing*

The structure model analysis verifies the rationality of the hypothetical model by investigating the relationship between each latent variable, exploring the possibility of the existence of other competition models, and determining the final model through the comparison between each model. All statistical fit indexes reflected the overall acceptability of the model structure. As shown in **Table 4**, the absolute fit index is 2.339, near 2, which meant that the index level is good; the root mean square error of approximation (RMSEA) is 0.067, near 0.5, the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI) reached about 0.8, and parsimony goodness of fit index (PGFI) is above 0.65. Relative fit index (NFI) and non-normed fit Index (NNFI) had reached an ideal level of 0.9, parsimony goodness of fit index (PGFI) is above 0.8, CFI and IFI are both above 0.9. Therefore, the theoretical model was acceptable judging from the analyzing results for the idealness of the goodness of fit for the hypothetical model and well fitness of the theoretical model and the sample data.

**Table 4** shows the structural relationship of standardized path coefficients and the results of theoretical hypothesis. Among these paths, one path of the standardized coefficient is not passed by significance test, that is, H4 has not been supported by empirical data. All other paths have passed the significance test, and the corresponding theoretical hypotheses have been supported by empirical data.

## CONCLUSIONS

This paper uses structural equation model to explore the main factors influencing the effect of bilingual teaching for the course of "introduction to e-commerce", and finds that the appropriateness of teaching materials has no significant effect, while the students' learning motivation, teachers' professional level and teachers' foreign language level are significantly affected the results of this research. Therefore, in the process of implementing bilingual teaching, universities should focus on student's learning motivations and teachers' quality.

On one hand, it is necessary to stimulate students' learning motivation that can be developed by the process of education through inspiring students' self-consciousness, stimulating students' curiosity and thirsts for knowledge and helping students form a stable interest in learning the course of "introduction to e-commerce". While to those students who are lacking of interest in the course, teachers can set hobby games or other games to indirectly stimulate students' learning motivation. In order to complete the game, students have to grasp the knowledge of the course first. Through this kind of games, the original motivation of learning would be stimulated and then the learning needs formed. Later, in order to maintain the existing learning needs, an appropriate level of motivation control should be done, such as creating novel and vivid situation in classroom teaching, inspiring students to actively thinking, launching professional knowledge competition combined with the course and related student organizations.

On the other hand, the overall improvement of bilingual teachers' quality is an urgent problem, because teachers' professional level and the ability to adopt bilingual languages are the two key elements in bilingual teaching. It is necessary to strengthen the training of bilingual teachers, especially teachers' foreign language training and strive to improve the professional level of bilingual teachers. The specific way of teachers' training can vary from teachers to study abroad or set up a full-time English training class in universities, or to regularly assign teachers to participate in e-commerce professional skills' training. In short, for the bilingual course of "introduction to e-commerce", teachers must have considerable advantages both in foreign language and professional expertise.

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