An Empirical Study on the English Teachers' Informatization Ability in Yunnan Ethnic Minority Area

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Abstract. This paper studies the teachers' informatization ability by sampling 1508 English teachers from secondary schools in the eight ethnic minority prefectures of Yunnan Province. The questionnaire data collected were analyzed with SPSS 22.0. The questions addressed were 1) The current situation of English teachers' information-based teaching ability; 2) The relationship between English teachers' information-based teaching ability and teaching level as well as English proficiency. Thus, this study came to the conclusion, namely, 1) The information-based teaching of English teachers in the minority areas of Yunnan Province is in a moderate level. 2) There is a significant positive but weak correlation between informatization teaching ability and teaching level and English proficiency.

Keywords: English teacher · Information teaching ability · Yunnan ethnic minority areas

1 Introduction

This paper aims to explore the information-based teaching ability of English teachers in minority areas of Yunnan Province. Through the investigation, this paper explores the current situation of English teachers' information-based teaching ability in the eight minority prefectures of Yunnan Province.

The 21st century is an information age. With the rapid development of knowledge economy in China, high-tech and information technology have penetrated into all aspects of human' lives, bringing a lot of convenience to communication. Nowadays, information technology and education are increasingly integrated. In 2010, the Chinese government officially issued the Outline of the National Medium and Long Term Reform and Development Plan (2010–2020). Chapter 19 of the document clearly proposes to "speed up the process of educational informatization". The Implementation Plan of Education Poverty Alleviation in Yunnan Province (2017) clearly states that it is necessary to strengthen the construction of teachers in rural areas, accelerate the promotion of compulsory education informatization, and basically achieve the full coverage of multimedia teaching in compulsory education schools by the end of 2020. Therefore, information technology

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has a revolutionary impact on the development of education, which must be paid high attention to.

Information teaching means that teachers can use information teaching means reasonably to complete teaching tasks with high quality. At this stage, education informatization has come to a new stage and micro class, flipped classroom, network teaching and research all reflect the integration of modern information and education, update education ideas, innovate teaching methods, and improve teaching efficiency (Zhang, 2014). Since the first year of webcast in 2016, information-based teaching has made new progress. The popularity of the novel coronavirus in 2020 has pushed the information technology to the peak. Under the background of educational informatization, the integration of information technology and disciplines has become the trend of education development (Liu, 2007).

Because of geographical location, historical development and other factors, there are great differences among different regions in China. These differences are mainly reflected in economy, culture and education. It mainly manifested in the differences between coastal and inland areas, eastern and western regions, urban and rural areas, non-minority areas and ethnic minority areas. From the perspective of education, there is a big gap in the development of basic education in China, which mainly displays that there is the better development of education informatization, complete teaching resources and accessories, and moderate development in the central region. The development of educational informatization in west China is poor, and the teaching resources are insufficient, which is urgent to be improved.

The research on the teacher's information-based ability in China only started 20 years ago. The relevant research mainly focuses on the concept, current situation and development of teachers' information-based teaching ability. However, there is a lack of empirical quantitative questionnaire survey. In the past, scholars focused on the research of teachers' information-based teaching ability in the developed areas, but few in remote areas, especially in ethnic minority areas. Besides, there is no research on the relationship between teachers' information ability and demographic variables as level of teaching ability, English proficiency etc. Most of the previous studies related used only the descriptive statistics of SPSS and few measured the data with the programs of SPSS such as correlation and regression.

2 Methodology

2.1 Research Questions

This research attempts to ask the following questions:

1) What is the general situation of information teaching ability in the ethnic minority area in Yunnan?
2) What is the relationship between information teaching ability and English teaching level and English proficiency?
3) Are there any important predictors of information teaching ability which affect the teachers' English teaching level and English proficiency?

2.2 Sampling and Samples

In this study, convenience sampling was used. The sample teachers came from the eight ethnic minority prefectures of Yunnan Province with a total of 1518 teachers of English as shown in Table 1.

Table 1. Personal information.

		N Frequency	Percent
Gender	Male	201	13
	Female	1317	87
Age	20–30	466	31
	31–40	664	44
	41–50	351	23
	51or above	37	2
School location	Junior high school	757	64
	Senior high school	419	36
Years of teaching	1–5 year	360	24
	6–10 year	349	23
	11–20 year	520	34
	21–30 year	257	17
	31 years or above	32	2
Education	Postgraduate	41	3
	Graduate	1405	93
	Senior college	70	5
	Secondary vocational education	2	0
Academic ranking title	Professor	3	0
	Senior	287	19
	Lecturer	806	53
	Assistant	333	22
	None	89	6
Major	English	1381	91
	Non-english	137	9

(*continued*)

Table 1. (*continued*)

		N Frequency	Percent
School location	City	750	49.41
	Country	768	50.59
Post	Full time	1344	88.54
	Part-time	131	8.63
	Special post	34	2.24
	Substitute	9	0.59

Note: Special post teachers is a special policy implemented by the central government for rural compulsory education in central and western regions. Through the open recruitment of college graduates to teach in rural schools at or below the county level in the central and western regions, we should guide and encourage college graduates to engage in rural compulsory education to innovate the supplementary mechanism for teachers in rural schools

2.3 Instruments

Questionnaire

Questionnaire is currently the most common method for evaluating TPACK. This questionnaire adapts five-point, seven-point or nine-point Likert scale. According to *The Standard of Educational Technology Competence for Primary and Secondary School Teachers* issued by the Ministry of Education (2014), and the questionnaire of Wang (2009) Doctoral Dissertation "Research on the development of teachers' information-based teaching ability" and Dang's (2013) thesis "Analysis and Countermeasures of Middle School English Teachers' Information-based Teaching ability", the author modified the questionnaire according to the research needs.

The questionnaire was divided into two parts. The first part is personal information including teaching age, education background, professional title, age, gender, major. Besides, the English proficiency and teaching level are included. The second part is about the current situation of teaching information. In this part, Five-point Likert Scale was adopted, which ranges from strongly disagree to strongly agree (1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree). The questionnaire consists of six factors, including teaching monitoring ability, teaching implementation ability, teaching cognition ability, teaching design ability, teaching research ability, and teaching innovation ability. There are 30 question items in the questionnaire, of which number 6, number 26 and number 28 are reverse questions. More details as follow. The Cronbach's Alpha Reliability Statistics of this questionnaire is .945, which is regarded as very high (Table 2).

Table 2. Information of questionnaire

Factors	Number
Teaching cognitive ability	1,2,5,7,12
Teaching design ability	3,4,8,11,20
Teaching implementation ability	6,9,10,13,21
Teaching monitoring ability	14,16,18,19,24
Teaching research ability	15,17,22,26,28
Teaching innovation ability	23,25,27,29,30

2.3.1 Self-Rated English Proficiency and Self-Rated Teaching Ability of the Subjects

Table 3. Self-rated English proficiency and teaching ability of the subjects

	English proficiency		Teaching ability	
	Frequency	Percent	Frequency	Percent
Poor	43	2.83	19	1.25
Average	540	35.57	447	29.45
Good	812	53.49	885	58.30
Excellent	123	8.10	167	11.00
Total	1518	100	1518	100

Table 3 presents the participants' self-evaluation of English proficiency and teaching ability. More than half of participants choose good in English proficiency and teaching ability, about 30% participants consider their English and teaching are average level. On the whole, most English teachers rate their English proficiency and teaching ability are good, but some English teachers evaluate their English proficiency and teaching ability are average.

2.3.2 Data-Analysis

The quantitative data collected were treated with SPSS22.0

1. Frequency was used to measure the personal information.
2. Descriptive Statistics was utilized to find out the current situation of English teachers' information ability.
3. Spearman Correlation Coefficient was employed to test the relationship between information teaching ability and teaching ability and English proficiency of the subjects.

4. Linear Stepwise Regression was employed to find out the important predictors of information teaching ability which affect teaching ability and English proficiency of the subjects.

3 Results and Discussions

3.1 The General Situation of the Subjects' Teaching

As is shown in Table 4, this study carried out descriptive statistics analysis on the overall factors of the teachers' information-based teaching ability of the English teachers in the eight prefectures of Yunnan Province.

Table 4. Descriptive analysis of five factors of information ability

	Descriptive Statistics		
	N	Mean	Std. deviation
Monitor	1518	3.83	0.85
Research	1518	3.42	1.05
Cognition	1518	4.03	0.67
Implementation	1518	3.85	0.79
Design	1518	4.01	0.79

Table 4 shows the mean and Std. D. of the five factors. The scores of each factor are ranked from the highest to the lowest as follows: cognition (Mean = 4.03, Std = 0.67), design (Mean = 4.01, Std = 0.79), implementation (Mean = 3.85, Std = 0.79), monitor (Mean = 3.84, Std = 0.85), research (Mean = 3.42, Std = 1.05).

It means that the overall level of information-based teaching ability of English teachers in the eight prefectures surveyed is relatively high. The subjects' ability of information monitoring, cognition, application and design is relatively strong, but the ability of information research is intermediate. At present, the middle and high school English teachers had a strong sense of information-based teaching, and were willing to apply information technology to their English teaching.

This result confirms the theory that teachers are expected to have an ability to conduct academic research in terms of analysis, design, development, implementation, and evaluation of technology integrated curriculum (Ge and Han, 2017). Schmidt (2009) conducted a research of 124 pre-service teachers in the United States and the questionnaire had seven dimensions which was the same as those put forward by Mishra and Kohler in 2005. The seven dimensions are pedagogical knowledge, technical knowledge, content knowledge, pedagogical content knowledge, technology content knowledge, technology pedagogical knowledge, and technology pedagogical and content knowledge. This questionnaire completed and detailed the items by organizing the items in a logical way. It is

one of the most widely used Technological Pedagogical Content Knowledge (TPACK) questionnaire and it has laid the foundation for many researches.

Although teachers hold a positive attitude to the application of information technology in teaching, their own information teaching concept and skills are still lagging behind, and the application of information technology only stays on the use of basic functions (Li, 2009). This result confirms the previous theory and has a certain guiding significance for improving information teaching ability and English teaching in ethnic minority areas of Yunnan Province, namely; the research ability of the subjects is still relatively weak, which needs to be further improved.

Research ability of English teachers in Yunnan minority areas is relatively weak, in the future studies, it is necessary to strengthen and enrich the research in this field, so as to provide more support for the informatization research ability. For educators and education managers, it is urgent to improve the ability of information technology research, and take some necessary measures, such as providing targeted information research training and effective online learning platform. In the future studies, ethnic minority teachers can also be taken as an independent sample to make clear the ability of English teachers in trilingual context and the relationship between trilingual and informatization.

3.2 The Relationship Between Information Teaching Ability and English Teaching Ability and English Proficiency

3.2.1 The Relationship Between English Proficiency and Information Teaching Ability

Table 5. Spearman coefficient correlation between information teaching ability and English proficiency

		Correlation				
		Monitor	Research	Cognitive	Implementation	Design
English proficiency	Spearman correlation	.245*	.10*	.264**	.248**	.252**
	Sig.(2-tailed)	0.00	0.00	0.00	0.00	0.00

Spearman Coefficient Correlation analysis of the relationship between the information teaching ability and English proficiency is displayed in Table 5. The correlation suggests that there was a significant, positive but relatively weak relationship between English proficiency and the five factors, i.e., monitor ability ($r = .245$, $p = .000 < 0.01$), research ability ($r = .10$, $p = .000 < 0.01$), cognitive ability ($r = .264$, $p = .000 < 0.01$), implementation ability ($r = .248$, $p = .000 < 0.01$) and design ability ($r = .252$, $p = .000 < 0.001$).

It means the subjects' information teaching ability and English proficiency positively affected each other to some degree.

Teachers' information-based teaching ability is related to their English proficiency, which has not been mentioned in previous studies. Therefore, the results of data research enrich the existing theories is concerned. The relationship between informatization ability and proficiency is mutual promotion. For educators, continuous improvement of their information-based teaching ability can promote proficiency, and the improvement of proficiency in turn has a positive effect on information-based teaching ability. In the future research, scholars can increase the research on the relationship between informatization ability and proficiency, and put forward more effective strategies to improve teachers' information-based teaching ability and English level, so as to improve the teaching quality.

3.2.2 The Relationship Between English Teaching Ability and Information Teaching Ability

Table 6. Spearman coefficient correlation between information teaching ability and English teaching ability

		Correlation				
		Monitor	Research	Cognitive	Implementation	Design
Teaching ability	Spearman correlation	.197**	.095**	.241**	.213**	.201**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00

Spearman Coefficient Correlation analysis of the relationship between the information teaching ability and English teaching ability is displayed in Table 6. The correlation suggests that there was a significant, positive but very weak relationship between teaching ability and two factors, i.e., monitor ability ($r = .197$, $p = .000 < 0.01$), research ability ($r = .095$, $p = .000 < 0.01$); there was a significant, positive but relatively weak relationship between teaching ability and three factors, namely, cognitive ($r = .241$, $p = .000 < 0.01$), implementation ($r = .213$, $p = .000 < 0.01$), design ($r = .201$, $p = .000 < 0.001$).

It signifies that the subjects' monitor ability and research ability and English teaching ability influenced each other to a small degree, and cognitive ability, implementation ability and design ability and English teaching ability influenced each other to some degree.

Teachers' information-based teaching ability is related to their English teaching ability, which has not been mentioned in previous studies. Therefore, the results of data research enrich the existing theories are related. The relationship between informatization ability and English teaching ability is mutual promotion. For educators, continuous improvement of their information-based teaching ability can promote English teaching ability, and the improvement of English teaching ability in turn has a positive effect on information-based teaching ability. In the future research, scholars can increase the

research on the relationship between informatization ability and English teaching ability, and put forward more effective strategies to improve teachers' information-based teaching ability and English teaching ability, so as to improve the teaching quality.

3.2.3 The Important Predictors of Information Teaching Ability Which Affect English Proficiency

Table 7. The important predictors of information teaching ability which affect English proficiency

Model summary		
Model	R	Adjusted R square
1	.264[a]	.069
2	.303[b]	.091
3	.308[c]	.093
a. Predictors: (Constant), cognitive	b. Predictors: (Constant), cognitive	b. Predictors: (Constant), cognitive
b. Predictors: (Constant), cognitive, design	c. Predictors: (Constant), cognitive, design	c. Predictors: (Constant), cognitive, design
c. Predictors: (Constant), cognitive, design, implementation	d. Predictors: (Constant), cognitive, design, implementation	d. Predictors: (Constant), cognitive, design, implementation

Table 7 shows the result of the linear stepwise regression of the six independent variables on the subjects' English proficiency. The first factor entered was cognitive ability, which explained 6.9% of the total variability of the dependent variable. The second factor entered was design ability, which decided 2.2% and the third factor was implementation ability, which affected 0.2%. Altogether, these three independent factors contributed 9.3% to the variance in English proficiency.

Compared with the previous research theories, this study analyzes the predictive factors, and confirms that these three factors (cognitive, design, implementation) can make important predictions for teachers' English proficiency. This discovery expands the dimensions of existing theories. For educators and education administrators, teachers' English proficiency can be enhanced from three factors. In the future empirical research, scholars can add predictive factor analysis to find out the important predictors of teachers' English proficiency in the information-based teaching ability.

3.2.4 The Important Predictors of Information Teaching Ability Which Affect English Teaching Ability

Table 8 shows the result of the regression of the six independent variables on the self-assessment of English teaching ability. The first variable entered was cognitive ability, which explained 6% of the total variability of the dependent variable. The second variable

Table 8. The important predictors of information teaching ability which affect English teaching ability

Model summary		
Model	R	Adjusted R square
1	.241[a]	0.06
2	.264[b]	0.07
a. Predictors: (Constant), cognitive		
b. Predictors: (Constant), cognitive, implementation		
c. Dependent variable: 19. English teaching ability		

entered were implementation ability, explaining 1%. These two independent variables contributed 7% to the variance in English teaching ability.

Compared with the previous research theories, this study analyzes the predictive factors, and confirms that these two factors (cognitive, implementation) can make important predictions for teachers' English teaching ability. This discovery expands the dimensions of existing theories for educators and education administrators, teachers' English teaching ability can be enhanced from the two factors. In the future empirical research, scholars can add predictive factor analysis to find out the important predictors of teachers' English teaching ability in the information-based teaching ability.

4 Conclusion

1. The English teachers' information-based teaching ability in minority areas of Yunnan Province is in a low level. In the application of information teaching, most teachers only know how to operate some simple basic information technology. Teachers' information monitoring, design and innovation ability is very weak.
2. There is significant and positive but weak correlation between the subjects' English proficiency and informatization teaching ability and teaching level.
3. Cognitive ability, design ability and implementation ability are the important predictors of information teaching ability which affect the subjects' English proficiency.
4. Cognitive ability and implementation ability are the important predictors of information teaching ability which affect the subjects' English teaching ability.

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