

## **CET-4 Education Research Based on Meta-cognitive Strategies By SPSS17.0**

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### **Abstract**

**This paper proposed a survey to study the correlation between meta-cognitive strategies (MSs) application and English autonomous learning (EAL) competence of non-English majors in Northwest A&F University. we designed by means of questionnaires, scores of College English test 4 (CET-4) and the semi-structured interview so as to explore the effectiveness of meta-cognitive strategies use on subjects' English autonomous learning competence and English academic achievement (EAA) and performance, namely scores of CET-4. The study will firstly present research questions, research subjects and research instruments in details, as well as the procedure of data collection and data analysis.**

### **Keywords**

**Meta-Cognitive strategies, CET-4, English autonomous learning, SPSS 17.0.**

### **1. Introduction**

When College English Curriculum Requirements offered the proposal on autonomous learning, innovating traditional college English teaching with computer and network in virtue of multimedia technology has become the current hot topic. According to College English Curriculum Requirements, College English as an integral part of higher learning is a required basic course for undergraduate students[1]. As a systematic whole, College English has its main components knowledge and practical skills of the English language, learning strategies and intercultural communication; it takes theories of foreign language teaching as its guide and incorporates different teaching models and approaches. The objective of College English is to develop Students' ability to use English in an all-rounded way, especially in listening and speaking, so that in their future studies and careers as well as social interactions they will be able to communicate effectively and improve their general cultural awareness so as to meet the needs of China's social development and international exchanges. It is especially important to achieve the objective of College English by improving learners' autonomous learning competences. Autonomous learning refers to the competence for learners to manage their own learning, and the learning attitude and mode to arrange their learning activities by self-organizing, self-evaluation and self-regulation[2-4]. Consequently, meta-cognitive strategy, as one of the main self-management strategies, plays a very important role in improving and developing the ability of autonomous learning and learning a language successfully. In short, meta-cognitive strategies are close related to autonomous learning, and both of them are containing the element of self-managing, self-monitoring and self-evaluating. Since 2015, we have tried to collect published papers on meta-cognitive strategies research in foreign language community at home, and has finished the literature accumulation and review in this field. In addition, the researcher improved and supplemented the paper continually, and completed a paper named "China's English Meta-cognitive Strategy Research over 15 Years"for publishing ultimately. By reviewing conditions and achievements of meta-cognitive strategies and autonomous learning, it draws the trend that researches in these two fields are increasing generally, and a growing number of scholars begin to concern them. The researches on them in China are approaching normalization and maturity and conforming to international research paradigms more and more. In December 2015, the preliminary

works are complete; the researcher finalized the topics basically, and then started to prepare research proposal.

## 2. Research Methodology

With the relevant literature reviewed, this chapter employs a survey to study the correlation between meta-cognitive strategies (MSs) application and English autonomous learning (EAL) competence of non-English majors in Northwest A&F University. The research designed by means of questionnaires, scores of CET-4 and the semi-structured interview so as to explore the effectiveness of meta-cognitive strategies use on subjects' English autonomous learning competence and academic achievement (EAA) and performance, namely scores of CET-4. The study will firstly present research questions, research subjects and instruments in details.

### 2.1 Research Questions

The present study aims to address the following four questions:

- (1).What are the status of MSs application and EAL competence originated from non-English majors in Northwest A&F University?
- (2).What are the differences of MSs application and EAL competence between CET-4 high-achieving and low-achieving groups?
- (3).What are the correlations of MSs application and EAL competence as well as EAA?
- (4).What are the influences of MSs and EAL on EAA, and how about their predictability?

### 2.2 Subjects

Subjects in this study were 151 non-English majors in Northwest A&F University. They were all sophomores, aged from 18 to 23(their average age was 20.47), selected from College of Plant Protection, College of Economic Management, College of Life Sciences and College of Agronomy. The basic information of the subjects is shown in table 1, and all the subjects were from four natural curriculum classes taught by the author and employed the same teaching materials. Among them, 26% of participants are from city while 74% are from countryside. The subjects of non-English majors in Northwest A&F University make the present study more significant and effective as well as targeted.

Table 1. Basic Information of the Research Subjects

College	College of Plant Protection	College of Economic Management	College of Life Sciences	College of Agronomy	Total
Stu. number	52	45	27	27	151
Male	28	18	13	15	74
female	24	27	14	12	77

All the subjects have taken the CET-4 in December 2015. According to their CET-4 scores, they were further classified into high-achieving group, intermediate group and low-achieving group. The descriptive statistics of the subjects' CET-4 scores are presented in table 2. There were 39 high-achieving participants, 62 intermediate participants and 50 low-achieving participants, the mean scores of CET-4 were 456.21 and the mean scores of high-achieving, intermediate and low-achieving groups were 523.72, 459.39 and 399.62 respectively.

Table 2. Descriptive Statistics of the Subjects' CET-4 Scores

Group	N	Minimum	Maximum	Mean	Std. Deviation
high-achieving	39	500.00	582.00	523.72	22.28517
intermediate	62	434.00	497.00	459.39	17.18115
low-achieving	50	365.00	425.00	399.62	17.39210
Valid N (listwise)	39				

### 2.3 Instruments

The research instruments include the website synthetically questionnaires for investigating the overall status of subjects' meta-cognitive strategies application and autonomous learning competence, the semi-structured interview and scores of CET-4 as well as SPSS17.0 statistic program[5]. Firstly, it is to collect data of subjects' meta-cognitive strategies application status and English autonomous learning competence by questionnaires. Secondly, it will do tracing investigation on how meta-cognitive strategies influence on English autonomous learning competence by semi-structured interview. Thirdly, it is to collect subjects' CET-4 scores in May, 2016. Finally, all results will be processed and analyzed by SPSS17.0 so as to find the correlation and relevance of meta-cognitive strategies (MSs) and English autonomous learning (EAL) competence as well as English academic achievement (EAA).

### 2.4 Questionnaires

In this study, the survey questionnaires on the use frequency of meta-cognitive strategies and college English autonomous learning competence were put together and published online. It was designed for this study reference to the authority questionnaires selected and issued, and in accordance with the actual situation of non-English majors in Northwest A & F University, it makes a partial revision.

The online questionnaire consists of three parts with 43 statements. Part one was the personal background information, involving 8 items on subjects' name, major, age, sex, hometown, whether past the CET-4 and whether know meta-cognitive strategies as well as self-evaluation one's own English autonomous learning competence[7].

Part two was Meta-cognitive Strategies Awareness Questionnaire (MSAQ) to survey the status of subjects' use frequency of meta-cognitive strategies with 12 statements. The three subcategories of meta-cognitive strategies are: self-monitoring; self-managing and self-evaluating. This questionnaire based on Strategy Inventory for Language Learning designed[3]. it is the most wide-spread and the authority in American language learning strategy research, which covers all the macro- and micro-strategies including listening, speaking, reading, writing, and it is widely applied to large-scale researches on learning strategy and researches on correlation factors. In order to ensure the research validity and pertinence, the questionnaire of meta-cognitive strategies (MSAQ) also take Language Learning Strategies Questionnaire designed for reference[7]. The latter is more suitable for Chinese learners' actual situation of learning strategies application in foreign language learning environment. The questionnaire of this thesis integrates and modifies both of them, moreover, some irrelevant strategies are deleted and some relevant meta-cognitive strategies are added.

Part three was Autonomous Learning Awareness Questionnaire (ALAQ); it was revised on the basis of "English Learners Autonomy Scale" designed[9]. The 23 items for investigating college English autonomous learning awareness can also be divided into three dimensions: (1) Evaluating the learning effect with items13-20 and 35, total 9 statements, for subjects' to evaluate their learning effect; (2) Monitoring the learning process, total 10 statements with items21-27 and 29, 33, 34 to monitor subjects' learning process; (3) The degree of depending on teachers, its 4 items standing for subjects' attitudes toward the role shift from teachers to students themselves, which are involving 28 and 30-32.

In addition, the questionnaires of both MSAQ and ALAQ were compiled and translated into Chinese, instead of English, to avoid possible misunderstanding for the participants. According to Oxford's rating scale[9], all statements, except for personal background part, adopted five-point Likert Scale description. There are five choices ranging from "never or almost never true of me", "usually not true of me", "somewhat true of me", "usually true of me" to "always or almost always true of me" respectively.

The questionnaires have been well-established with high reliability and validity, the reliability and validity test of the MSAQ and ALAQ were analyzed by SPSS17.0. Generally speaking, Cronbach Alpha Coefficient is used to test the consistency which range from 0.00 to 1.00, and researchers agree that the Cronbach's Alpha should not lower than 0.70 in the researches of English teaching and learning. In table 3, the results show that the Alphas of MSAQ and ALAQ are .919 and .860 respectively. Therefore, both MSAQ and ALAQ take on high reliability and validity, which are meeting the requirement to conduct further research.

Table3. Reliability Statistics of the Questionnaires

Questionnaires	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
MSAQ	.919	.919	12
ALAQ	.860	.874	23

On April 7th, 2016, the questionnaires were issued on one technical questionnaire website by author personally, and then the website link of published questionnaire was attached to the class announcement of the online classes taught by the author for all the subjects.

### 2.5 Semi-structured Interview

The present study adopted semi-structured interview. The semi-structured interview has been favored by many researchers, particularly those working within an interpretative research tradition[11]. the oral interview has been widely used as a research tool in applied linguistics and interviews can be characterized in terms of their degree of formality, and most can be placed on a continuum ranging from unstructured through semi-structured to structured. In fact, this interview method has many advantages, and the initiative in the process of interview is mainly controlled by the interviewer, it gives the interviewer a degree of power and control over the course of the interview, besides it is a two-way communication, it can help to obtain more abundant complete and thorough information than material research. In short, the semi-structured interview can combine structural content with the flexibility it gives to the interviewer. In order to combine the qualitative study with the quantitative study, the present study selected 15 participants randomly to accept the interview.

### 2.6 Scores of CET-4

All the subjects in this study have taken the CET-4 in December 2015, and their scores were collected in May 2016. At present, the CET-4 is one of the most authoritative tests for undergraduates of non-English majors, which aims at evaluating students' proficiency in English listening, reading, writing and translation. Therefore, the scores of CET-4 are used to measure students' language proficiency[11]. That's why a considerable number of colleges and universities in China have been paid too much attention to the CET-4 pass rate, some of them have even made a policy that graduates cannot get their bachelor's degrees without passing CET-4. In this study, the CET-4 scores stand for subjects' academic performance and it may contribute to explore the relationship between meta-cognitive strategies and academic performance, meanwhile, to prove the similarity in CET-4 scores between English autonomous learning abilities and academic performance.

### 3. Data Collection

SPSS is one of the most widely used programs for statistical analysis in social science, and it is used by market researchers, survey companies, education researchers and others. In this thesis, SPSS17.0 of English edition will be adopted to process and analyze data of questionnaires and scores of CET-4 with descriptive statistics, independent samples T-Test, correlation study and multiple linear regression analysis so as to conduct the correlation of meta-cognitive strategies and English autonomous learning competence as well as English academic achievement. This thesis will combine quantitative and qualitative researches to collect raw data and analyze data, and it mainly based on questionnaires investigation and semi-structured interview tracing investigation or case study[12]. The data collection mainly consists of three stages, and the whole process was conducted by author in person carefully.

The first stage intends to probe the subjects' real status of meta-cognitive strategies (MSs) application and English autonomous learning (EAL) competence by questionnaire. Before filling out the questionnaires, all the subjects received uniform instructions on how to complete the questionnaires. There's a brief introduction on the research purpose only for research, the subjects were informed that their answers have no right or wrong and the survey was just to response their personal condition of English learning, and it will not affect their final English academic achievement, meanwhile, all the information would be kept with great confidentiality so as to encourage the subjects answer the questions in honesty[13]. The whole procedure lasted for 15 minutes. All the participants were given sufficient time to finish the questionnaires online freely. After issuing the questionnaire on the website, all the subjects filled it in online continually. It started on 7th, April and ended on 24th, June, 2016, which lasted for nearly 12 weeks. As pointed in 3.2, all the subjects were chosen from four colleges in Northwest A&F University, and they are majoring in Plant Protection, Business Management, Agriculture Science and Applied Chemistry respectively, and all the subjects were coming from seven natural classes. In conclusion, the number of clicks and visits were 220 and 196 respectively, and total 151 subjects filled out questionnaire online completely, involving Plant Protection total 52 students, including 28 boys, 24 girls; Business Management total 45 students, including 18 boys, 27 girls; Agriculture Science total 27 students, including 15 boys, 12 girls and Applied Chemistry total 27 students, including 13 boys, 14 girls (shown in Table 1).

The second stage is to select at least 15 participants (about 10% of all the subjects) randomly to do tracing investigation and case study by interview. Apart from asking for each individuals specific information, the aim of the interview also concerns making sure the validity and truthfulness of the questionnaire data. The interview was carried out from May 9 to May 27, 2016, and it was conducted face to face in the classroom or after class from QQ chatting, which lasted for 15 days to interview every one participant every day. In order to reflect the interviewees' real situation and thoughts, they were not been informed about the pedagogical purpose of this study. All the interview questions were asked in Chinese so as to relief interviewees' tensions and to get rid of the language obstacles, the interviewees were encouraged to speak out their mind freely. It nearly lasted about 20 or 30 minutes conducting the interview for each interviewee, the whole process seems like a friendly chitchat with the interviewees, it was not tape-recorded but took brief notes. The interview consists of 10 semi-open questions about their English learning and learning strategies use. These questions are closely related to the questionnaire used in the survey study.

The third stage is to collect all the subjects' scores of CET-4. The examination results were announced in March 2016. The author informed all the students in her class to register their scores of CET-4 on the enrollment form by themselves accurately, including all 151 subjects' scores of CET-4. And then, the author collected the data all the subjects' scores of CET-4 according to the website questionnaires filling and finishing situation. In addition, all the subjects were further classified into high-achieving group, intermediate group and low-achieving group according to their scores of CET-4 (See Table 2).



#### 4. Conclusion

The results of questionnaires and scores of CET-4 were analyzed by SPSS17.0. The descriptive statistics, independent-samples t-test, correlation analysis and multiple linear regression analysis were used to probe into the differences and correlations of subjects' MS use frequency, EAL competence and EAA, at the same time to explore the influence of MS and EAL on EAA, namely the scores of CET-4.

Firstly, the descriptive statistics was adopted to describe the results of questionnaires and the subjects' CET-4 scores on overall view on subjects' MS and EAL and the differences of MS and EAL between CET-4 HA and LA groups.

Secondly, independent-samples t-test was used to analyze whether there is a significant difference between the CET-4 HA and LA groups in use of MSs and EAL competence.

Thirdly, the thesis is mainly to study whether there are any correlations between the use frequency of MS and subjects' EAL competence as well as their EAA, namely scores of CET-4 by the SPSS Pearson Correlation and Sig.

Finally, the aim of multiple linear regression analysis were used to probe into the relationship of MSs and EAL to EAA, that is scores of CET-4, and the predictability of MSs and EAL two variables so as to survey the influence of the subjects' MSs use frequency and EAL competence on EAA thoroughly.

As to the qualitative research of semi-structured interview, the materials were collected and analyzed by interviewees' narration and comments. Therefore, the thesis is to combine the qualitative study with the quantitative study so as to obtain relatively perfect findings and recommendations for future research.

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