

Chinese College English Learners' Attitudes and Behaviors in Computer-Assisted Autonomous Language Learning

Guo Yan

Huazhong University of Science and Technology, P. R. China

Qin Xiaoqing

Huazhong University of Science and Technology, P. R. China

This paper reports a study that examined Chinese college English language learners' out-of-class computer-assisted autonomous language learning (ALL) by means of questionnaires and interviews. Data were collected from 345 students enrolled in college English courses at three levels: basic, intermediate, and advanced. Their computer-assisted ALL behaviors and the value they attached to computers and networks for ALL were identified. Descriptive statistics showed that they held favorable attitudes towards ALL assisted by computers and networks, but they did not show a high frequency of ALL behaviors. The correlation analysis yielded significant positive relationships between attitudes and behaviors. Repeated one-way ANOVAs revealed significant differences in both attitudes and behaviors among the students of the three levels. The advanced students showed the most favorable attitudes and the highest frequency of computer-assisted ALL behaviors while the basic-level students demonstrated a medium degree of support for computer-assisted ALL and the least frequency of ALL behaviors. Interview results indicated that the students' attitudes towards computer-assisted ALL and the teachers' positive intervention in the language classes might be two important factors contributing to the differences in ALL behaviors.

Key words: autonomous language learning (ALL), computers and networks, attitude, behavior, college English language learners

INTRODUCTION

Learner autonomy in second/foreign language education has been promoted across the globe, and its popularity can be partially related to the increasing importance of computers in language learning (Schmenk, 2005). Over the past decade, a growing number of studies have been devoted to autonomous language learning (ALL) assisted by the use of computers and networks. Considered as being able to greatly increase the opportunities for learners' exposure to English and other languages and to provide a more flexible learning environment accommodating individual needs and preferences, computers and networks have been integrated into various language learning curricula and self-access language learning centers based on computers and networks have been established in universities and colleges worldwide. In China, with the implementation of the *College English Curriculum Requirements*, the past 5 years has witnessed the extensive use of computers and networks in college English teaching. Computer-based materials have been utilized on a large scale in classroom instruction, ALL in high-technology-driven self-access language learning centers has become part of the curriculum, and a multitude of computer- and Web-based courses have been developed. With the assistance of computers and networks, college English learning is supposed to be "free from the constraints of time or place and geared towards students' individualized and autonomous learning" (National Education Ministry of the People's Republic of China, 2004, p. 19). In such a context, the use of technology in language learning is an important area for research, particularly the understanding of "the human element – teachers and students – and their attitudes, beliefs, and applications of technology" (Kessler & Plakans, 2008, p. 269). The present study focuses on students and attempts to explore Chinese college English learners' attitudes towards the value of computers and networks in ALL and their computer-

assisted ALL behaviors outside the classroom.

LITERATURE REVIEW

Learner autonomy was defined by Holec as “the capability of taking charge of one’s own learning” (1981, p. 4), which provided an initial theoretical framework for future research in the field. Autonomous language learning (ALL) consists of three essential components: structure, control and responsibility (Murray & Kouritzin, 1997). In other words, learners must be operating within a structure that enables them to exercise control over their learning and to assume the responsibility that this entails (Holec, 1981). Later on, other researchers also put forward definitions in their own terms (e.g., Benson, 1997; Dickinson, 1987; Little, 1991; Littlewood, 1996), but the core remained the same. In the present study, Dickinson’s (1987, p. 11) definition as “the situation in which the learner is totally responsible for all of the decisions concerned with his learning and the implementation of those decisions” is particularly useful as we examine the concept in out-of-class self-study contexts where there is no direct teacher intervention and students are free to make choices about what materials to use, when to study, and how the learning is assessed, experiencing ALL to the fullest degree.

With the establishment of the concept, how to foster learner autonomy became a central concern. Some researchers attempted to analyze how learners develop their autonomy from the affective perspective. Attitude, an affective factor, was suggested as one of the psychological characteristics that predisposes learners to undertake responsibility for their own learning (Little, 1999; Long, 1994). Wenden (1998) defined attitudes as “learned motivations, valued beliefs, evaluations, what one believes is acceptable, or responses oriented towards approaching or avoiding” (p. 52) and claimed that the two kinds of attitudes that are crucial to autonomous language learning are those relating to learners’ evaluations of their own role in the learning process and their learning ability. Cotterall (1995) proposed a six-dimensional construct

underlying attitude and argued that learners' attitudes and beliefs may either contribute to or impede the development of their potential for autonomy. By investigating attitudes, strategies and language learning outcomes in self-directed learning, Gan (2004) proposed that attitudes might exert an effect on language learning outcomes through the mediation of strategies. Guo's (2007) study on Chinese postgraduate EFL learners found that attitudes positively correlated with autonomous learning behaviors, but the correlation was not high.

With the rapid development of computer technologies, computer-based materials and computer-assisted language learning have been widely regarded as having a positive influence on learner autonomy (Warschauer, 1995; Warschauer et al., 1996). Benson (2001, pp. 140-141) argued that "claims made for the potential of new technologies in regard to autonomy need to be evaluated against empirical evidence of the realization of this potential in practice". As a matter of fact, empirical studies on computer-assisted ALL have been conducted extensively and positive effects reported both abroad (e.g., Chang, 2005; Ho & Crookall, 1995; Luke, 2006; Murray, 1999; Murray & Kouritzin, 1997; Schwienhorst, 2003; Yumuk, 2002) and in China (e.g., Chen et al., 2005; Jiang, 2006; Jin et al., 2005; Liang et al., 2005; Yu, 2006; Zhao & Hao, 2006). However, the publications were primarily concerned with examining how computer-assisted ALL programs could effectively upgrade students' autonomy in classroom settings. They did not look at what learners did when a variety of computer-based materials were available to them outside the classroom. For example, Murray (1999) investigated the learners' experiences of ALL in an interactive video program, Yumuk (2002) probed into how an Internet-information-search-based ALL program in an academic translation course promoted a more autonomous view of learning, Schwienhorst (2003) discussed how tandem learning via computer mediated communication (CMC) could facilitate autonomy, and Luke (2006) reported increased autonomy in a technology-enhanced, inquiry-based ALL program with a fourth-semester university Spanish class.

Classroom autonomy promotion with the help of computers and networks

is certainly of great importance. However, according to Kjisik (1997), autonomy should not be limited to the classroom. Horwitz (1987) also cautions that a large proportion of students' language learning goes on outside of the classroom and how students regulate this aspect of learning is crucial to their success as language learners. The ultimate aim of promoting autonomy in class is to help learners develop the awareness and ability of life-long learning and independent learning, and put into practice those learning modes in various contexts, particularly the out-of-class self-study contexts. This is especially vital for Chinese college English learners. Their regular college English classes leave little room for the practice of autonomy due to the nature of traditional classroom instruction and large class size. Their learning in the self-access language centers is required, controlled and monitored by teachers, indicating low autonomy or only "reactive autonomy" (Littlewood, 1999, p. 76). By contrast, it is outside the classroom that they are totally responsible for all of the decisions concerned with their learning and the implementation of those decisions (Dickinson, 1987). Nonetheless, in China there also seemed to be a lack of research and publication on computer-assisted ALL as well as ALL in general that were conducted in out-of-class contexts.

Besides the lack of attention to out-of-class computer-assisted ALL, most of the previous studies presented only a general picture of learners' autonomy development, without taking into account the differentiation of student types. Broady (1996) suggested that different types of individuals might have distinct sets of attitudes towards ALL. Likewise, they may have different attitudes towards computer-assisted ALL, and thus employ different ALL behaviors. Since 2004, college English teaching in China has been conducted at three levels in accordance with students' aptitudes, needs, English proficiency levels, etc. Researching into ALL conducted by students at different levels may hold great promise for improving pedagogy in individualized teaching and learner autonomy.

With the research background discussed above, the present study focuses on Chinese college English learners enrolled in college English courses at

three levels and investigates what attitudes they hold towards computer-assisted ALL and what computer-assisted ALL behaviors or activities they carry out outside class. The research questions are:

1. What types of out-of-class computer-assisted ALL attitudes and behaviors do the subjects have?
2. What relationships, if any, exist among out-of-class computer-assisted ALL attitudes and behaviors?
3. What differences, if any, exist in out-of-class computer-assisted ALL attitudes and behaviors among the subjects at three levels?

METHOD

Participants

A total of 345 English learners from a top national university in Wuhan participated in the study right after they finished their third-semester English learning courses. All the participants were asked to report through questionnaires their attitudes towards computer-assisted ALL and the computer-assisted ALL behaviors or activities they engaged in outside class through the semester. Among the participants, 329 completed their questionnaires, achieving a response rate of 91.4%. These 329 subjects consisted of 224 males (68.1%) and 105 females (31.9%). Although they were not randomly selected due to administrative problems, students from as many majors as possible were included in the study to represent the population of college English learners in China.

The subjects were enrolled in college English courses at Levels 1, 2 and 3, corresponding with the respective basic, intermediate and advanced requirements stated in the *College English Curriculum Requirements*. The basic requirements are the minimum standard that all students must reach before graduation. The students who are relatively more proficient in English and have stronger capacity for learning are encouraged and enabled to meet

the intermediate or advanced requirements. During the two years of formal English language study at college, Level 1 students only take the Integrated Skills Course and the Listening and Speaking Course to fulfill their credits. Levels 2 and 3 students, on the other hand, are offered more courses to acquire specialized language skills and intercultural competence, such as Media Listening, Business English, Advanced Oral English, Cross-Cultural Communication, etc. In the present study, 108 students were from Level 1, 115 from Level 2, and 106 from Level 3.

Instruments

A questionnaire comprising three parts was developed with theoretical input suggested in the literature (Cotterall, 1995; Li, 2005; Warschauer, 1996), first-hand information initially derived from the researchers' teaching experiences and observations, and insights from discussions and interviews with teachers and students. In order to ensure accurate, clear and quick understanding, the questionnaire was written in Chinese, the subjects' mother tongue. Part 1 of the questionnaire aims to acquire the subjects' personal information, including gender, access to the Internet and other networks, and time devoted to out-of-class ALL each week. Part 2 intends to collect data pertaining to the respondents' attitudes towards computer-assisted ALL which consist of three components – cognitive, affective and behavioral (Wenden, 1998). Part 3 focuses on the students' actual computer-assisted ALL behaviors outside class, such as the use of e-mail exchanges in English for real-life communication, the utilization of CD-ROMs, DVDs, and other language learning software, and the accessing of online language learning materials, to name a few. A Likert-type scale with five response options was used in scoring Parts 2 and 3, ranging from 1 (strongly disagree / I never do this) to 5 (strongly agree / I always do this). All the negatively worded statements were reversely scored.

The questionnaires were administered to the students in regular class time, and the respondents were given about 15 minutes to complete the questionnaire.

In order to minimize the possibility of response bias (Ehrman & Oxford, 1995), prior to the distribution of the questionnaires, the students were assured that there was no right or wrong answer, that their responses would not affect their assessment in the English course, and that all the data would be kept strictly confidential and used only for research purposes. To check the internal consistency of the two scales, the reliability analysis was first conducted. The Cronbach's coefficient alpha is 0.809 for the Attitude Scale and 0.893 for the Behavior Scale. Both are high enough to assure the reliability of the scales.

Because both scales were developed by the researchers for this particular study, factor analysis was conducted to measure their construct validity. Through principal component analysis with varimax rotation, 4 factors were extracted for the Attitude Scale, accounting for 53.405% of the variance. They were named "Advantages of computers and networks," "Learning difficulties in computer-assisted ALL," "General perceptions of ALL," and "Disadvantages of computers and networks." For the Behavior Scale, again 4 factors were extracted, which accounted for 56.564% of the variance. They were named "ALL via the Internet," "The use of communicative functions of networks," "ALL for facilitating classroom study," and "ALL for good grades." The specific items of the two scales are listed in Appendix 1.

As questionnaires only provide general assessments of the students' typical attitudes or behaviors, one week after the administration of the questionnaires, semi-structured interviews with 10 randomly-selected subjects from each level were conducted. General interview questions were formulated to serve as prompts to move the dialogues on in the interviews but were not strictly followed. Most of the questions were open-ended, allowing the interviewees to describe their out-of-class English language learning experience in more detail. Sample interview questions can be found in Appendix 2.

Analyses

All the quantitative data were coded and processed using the SPSS 13.0.

Descriptive statistics were first obtained to identify the overall characteristics of out-of-class computer-assisted ALL attitudes and behaviors. Then, correlations among the two variables and specific factors were computed to examine their relationships. Lastly, one-way ANOVAs were conducted to find out whether and where the students at each level were significantly different from each other in the two variables. Qualitative data from the interviews were analyzed and presented accompanying the discussions of the quantitative data.

RESULTS

Out-of-Class Computer-Assisted ALL Attitudes and Behaviors

Along the five-point Likert scale, averages of 3.5 or higher are generally considered high use or positive attitude, averages of 2.5-3.4 medium use or medium degree of support, and averages of 2.4 or lower, low use or low degree of support (Oxford & Burry-Stock, 1995). The students at all the three levels in the present study were found to be supportive of computer-assisted ALL out of class with the mean score of overall attitudes being around 3.5. In particular, a remarkably high degree of agreement and complete agreement was found with respect to the respondents' general perceptions of ALL ($M > 4.0$) and their attitudes towards the advantages of computers and networks in ALL ($M > 3.5$). It indicates that the respondents generally identified with the notion of ALL in their English language study as well as the benefits that computers and networks may bring to their ALL. However, with the mean scores being only slightly above 2.5, the students' attitude towards overcoming learning difficulties in computer-assisted ALL was significantly less positive, implying that certain factors may hinder the incorporation of the use of computers and networks in their ALL outside class. The detailed descriptive results of the Attitude Scale can be found in Appendix 3.

By contrast, with all the mean scores of overall behaviors being only

slightly above 2.4, none of the three levels of students reported a high frequency of computer-assisted ALL behaviors outside class. Among the four factors, the use of communicative functions of networks received the lowest score of frequency ($M < 2.4$), suggesting that this power of computers and networks was far from being adequately explored and utilized by the subjects. Relatively speaking, more activities of ALL via the Internet were reported ($M > 2.5$), which indicates that computers and networks did play a part in the subjects' out-of-class ALL. Detailed descriptive results of the Behavior Scale are shown in Appendix 4.

Relationships among Out-Of-Class Computer-Assisted ALL Attitudes and Behaviors

Pearson's product-moment correlation analysis was conducted and significant positive correlation was found between overall attitudes and behaviors ($r=0.42, p=0.000$). Among the factors, the respondents' attitudes towards the advantages of computers and networks and their general perceptions of ALL in the Attitude Scale exerted relatively more effect on their actual computer-assisted ALL, with the correlation coefficient being 0.35 and 0.34 respectively. In the meantime, their ALL via the Internet and ALL for facilitating classroom study in the Behavior Scale were more affected by their overall attitudes towards computer-assisted ALL, with the correlation coefficient being 0.45 and 0.34. The detailed results are shown in Appendix 5.

Differences in Out-of-Class Computer-Assisted ALL Attitudes and behaviors

One-way ANOVAs were conducted for both the Attitude Scale and the Behavior Scale. Significant differences in overall attitudes existed between Levels 1 and 3 students and between Levels 2 and 3 students but not between Levels 1 and 2 students. Such a pattern of differences was also detected with regard to their general perceptions of ALL. As for the attitudes towards the

advantages of computers and networks in ALL, differences were observed only between Levels 1 and 3 students. Therefore, Level 3 students appeared to be significantly more favorable about the advantageous features of computers and networks in ALL and to assume much greater responsibility and confidence in independent language learning outside class. Regarding the learning difficulties in computer-assisted ALL and the disadvantages of computers and networks in ALL, no difference was found among the three levels. Detailed one-way ANOVA results for the Attitude Scale can be found in Appendix 6.

As to the Behavior Scale, significant differences in overall behaviors were found between Levels 1 and 3 students and Levels 2 and 3 students, but not between Levels 1 and 2 students. Such a pattern of difference was also observed with respect to ALL via the Internet and ALL for facilitating classroom study. It can be seen that Level 3 students appeared to perform significantly more computer-assisted ALL out of class and their behaviors accorded with their mental support for computer-assisted ALL. With respect to the use of communicative functions of networks and ALL for good grades, the students' behaviors did not differ across the three levels. Detailed one-way ANOVA results for the Behavior Scale are shown in Appendix 7.

DISCUSSION

In the study, the subjects generally reported strong favorable attitudes towards out-of-class computer-assisted ALL except for one attitudinal factor, that is, overcoming learning difficulties in computer-assisted ALL. Echoing this, the students' reported frequency of computer-assisted ALL behaviors out of class is only moderate. Such a finding lends support to the Technology Acceptance Model (TAM) (Davis, 1989) which suggests that when learners are presented with new technologies, two major factors, perceived usefulness and perceived ease of use, will influence their decisions about how and when they will use them. Although the learners in the present study hold that the

easy access to computer-based materials and the advantages of computers and networks would enhance their language learning performance, in reality, the use of them in out-of-class ALL requires a certain amount of effort due to various learning difficulties. Therefore, the perceived unease of use hinders their behavioral intention to use the technologies and, consequently, results in a low frequency of actual use.

More importantly, it was found that the students at all the three levels were more reluctant to exert effort on overcoming the learning difficulties in computer-assisted ALL than to handle the external disadvantages of computers and networks. In their view, the physical inconvenience in using computers and networks in out-of-class ALL, such as breakdowns of computer, huge amounts of information flow, and time-consuming process of searching work, can be relatively easily overcome by themselves. By contrast, learning difficulties like the lack of systematic structure, difficulties in selecting useful learning materials, large amounts of distracting materials on the Internet, and harsh differences between classroom English and real-life English encountered on the Internet are beyond their capability to overcome and have caused anxieties and even negative impacts on their ALL. Such an attitudinal difference shown by the students may alert teachers that concrete support from teachers in addressing the learning-related difficulties in computer-assisted ALL is urgently needed and can be of vital importance. For instance, more explicit guidance and assistance should be offered in selecting appropriate Web-based learning resources, and more measures must be taken to bridge the gap between classroom English and real life English on the Internet.

In the correlation study, significant positive relationships were found among the subjects' general attitudes and behaviors, showing that the more positive attitudes the students hold towards computer-assisted ALL, the more likely they would take actions and apply their thoughts into learning practice, echoing the findings of McCombs (1990), Long (1994), Little (1999) and Wenden (1998). In particular, the degree to which they perceive the helpfulness of computers and networks and the degree of their perceived autonomy and

confidence in conducting ALL will affect their ALL behaviors. The differences discovered between Level 3 students and Levels 1 and 2 students also support the above finding. Level 3 students were more in favor of the advantages of computers and networks in out-of-class ALL, and they have developed much greater awareness of shouldering the responsibility of independent English learning. They have also cultivated a greater degree of confidence in conducting effective ALL outside the classroom. Accordingly, in the Behavior Scale, they exhibited a higher frequency of computer-assisted ALL behaviors, especially ALL via the Internet (the mean score being close to 3.5). In contrast, Levels 1 and 2 students showed less interest and confidence in computer-assisted ALL and their frequency of ALL behaviors was significantly lower. Thus, the implication for pedagogy is that to enhance autonomy, teachers must, first and foremost, help learners adopt more positive attitudes towards ALL and new technologies and build their confidence in independent learning.

Regarding the ALL for facilitating classroom study, Level 3 students reported a significantly higher frequency than Levels 1 and 2 students. It was revealed from the Interviews with them that teachers' intervention in the advanced English courses has played a vital part in urging the students to make full use of computers and networks in out-of-class ALL. One Level 3 student said, "We have been divided into groups. Almost every group has to give presentations on a certain topic in class. In order to prepare well, we usually turn to the Internet for more materials and insights into the understanding of the topics. If not, our performance in class will not be good." The teachers teaching Level 3 students were found to set higher demands and standards on them, which in turn stimulated the students to turn to computers and networks for more resources and information to confront the challenging coursework and assignments. Unfortunately, Levels 1 and 2 students were not or less spurred by such forces. One Level 1 student said, "The English teacher delivers lectures basically according to the textbooks. It is boring. I've read those articles many times. There is no challenge in class." As these students were seldom involved in challenging classroom activities

and assignments, it gradually resulted in their laziness in creative thinking, adventurous experimenting and independent learning. The contrast indicates that teachers' positive intervention in class, for instance, in establishing links between what students do independently outside class and what goes on in the classroom (Jones, 2001), could promote in students reactive autonomy, if not proactive autonomy. We suggest that teachers engage Levels 1 and 2 students in more meaningful, motivating and challenging language activities and tasks so as to encourage more involvement in out-of-class computer-assisted ALL to foster their autonomy.

It is also of importance to note the communicative functions of computers and networks that have been least utilized by the subjects at all the three levels. Interview results revealed that the students generally hold the opinion that oral English cannot be practiced via computers or networks. This type of thinking may have hindered their exploration and taking advantage of such powerful functions of computers and networks. For example, from their point of view, exchanging e-mails or chatting online with English teachers, e-pals or other English speakers (either native or non-native) is not oral but writing practice. They have not come to terms with the notion that such practice is definitely one form of oral English practice, which on the surface level is not speaking the language aloud, but deep down is the very practice for oral fluency and accuracy. As is well known, speaking practice entails the training of not only pronunciation and intonation of vocabulary but also quick organization of ideas and thoughts in the new language for effective communication. In this respect, computers and networks have provided more powerful and convenient practice tools than ever before, and it is urgent for teachers to raise the students' awareness at all the three levels so that they can make better use of these tools.

CONCLUSION

The questionnaires and interviews in this study found that Chinese college

English learners enrolled in college English courses at all the three levels reported favorable attitudes towards computer-assisted ALL, but they did not show a high frequency of computer-assisted ALL behaviors out of class partly because of the perceived difficulty of its use. Significant positive correlations were found among attitudes and behaviors, indicating that attitude, a psychological attribute, did have some influence on behaviors. Students at the advanced level, driven not only by their highly favorable attitudes towards computer-assisted ALL but also by their college English teachers' positive intervention in class, exhibited the highest frequency of computer-assisted ALL behaviors outside class. Students at the basic level, on the other hand, showed the least frequency of behaviors despite their medium degree of support for computer-assisted ALL. Such a result can be attributed to the students' less interest and confidence in ALL as well as less stimulation from college English teachers and courses. Therefore, to enhance autonomy among these students, the study suggests that teachers incorporate more meaningful, motivational and challenging language activities both in and out of class, and to provide more specific and individualized guidance and support for the students. As for the learning difficulties in computer-assisted ALL and the lack of application of communicative functions of computers and networks for oral practice, two measures, offering explicit assistance and raising students' awareness, are recommended.

Although important findings have been attained from the study, there exist some drawbacks. For example, the subjects were all from one university and not randomly selected, so they might not be able to represent the whole population of Chinese college English learners. Regarding the research methods, if more qualitative means like objective observation and students' journals and reports of out-of-class computer-assisted ALL can be employed, more in-depth information might have been obtained.

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THE AUTHORS

Guo Yan is a lecturer in the School of Foreign Languages of Huazhong University of Science and Technology in P. R. China. Her current research interests cover applied linguistics and translation studies. Her recent publications include *A study of college English teachers' teaching and students' use of language learning strategies from the perspective of correlation* (2007) and *A process approach to teaching culture* (2008).

Email: guoyan@mail.hust.edu.cn

Qin Xiaoqing is a professor in the School of Foreign Languages of Huazhong University of Science and Technology in P. R. China. His current research interests cover second language acquisition and L2 research methods. His recent publications include *Questionnaire survey and administration in EFL classrooms* (FLTRP 2009), *Questionnaire surveys in EFL teaching and learning: Trend and selection of research topics* (2008), *EFL writing at the tertiary level in China: A developmental perspective* with Wen Qiufang (2007).

Email: qxq@mail.hust.edu.cn

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APPENDIX 1

Out-of-class Computer-assisted ALL Attitudinal Variables

1. Advantages of Computers and Networks (8 items)

The authentic English materials provided by computers and networks intrigue students' interest in learning English.

The videos, pictures, games and flashes contained in computers and networks attract students to the learning of English outside of class.

Computers and networks provide a new means for students to learn English autonomously outside of class.

The use of computers and networks helps students to learn English effectively outside of class.

Autonomous English learning outside of class with computers and networks brings a sense of achievement.

(-) To learn English autonomously outside of class, students just need to memorize vocabulary, do exercises, and practice listening without computers and networks.

Large quantities of English informational materials provided by computers and networks serve as useful extensive reading materials.

Students feel little anxiety when learning English with computers and networks compared with the classroom setting.

2. Learning Difficulties in Computer-assisted ALL (4 items)

(-) There is no systematic structure when learning English autonomously with computers and networks outside of class.

- (-) Large amounts of distracting materials on the Internet draw students' attention and make them unable to focus on study.
- (-) A mixture of both good and bad learning materials makes it hard for students to choose.
- (-) The harsh difference between textbook English learned in class and authentic English on the Internet makes students unable to understand real-life English and reluctant to learn English with computers and networks outside of class.

3. *General Perceptions of ALL (3 items)*

- I should assume the responsibility of learning English on my own in whatever environment.
- Out-of-class autonomous English learning is of great importance to successful English learning.
- I believe that I have the ability to learn English autonomously and effectively outside of class.

4. *Disadvantages of Computers and Networks (3 items)*

- (-) Breakdowns of computers and networks bring inconvenience to out-of-class computer-assisted autonomous English learning.
- (-) It is time-consuming to sort through English learning materials on the Internet.
- (-) There are too many learning materials on the net, which makes me feel anxious.

Out-of-class computer-assisted ALL behavioral variables

1. *ALL via the Internet (9 items)*

- Outside of class, I log on to English learning websites to learn English autonomously, for instance, I listen to VOA online, read the news online, etc.
- Outside of class, I get online to read the news, short stories, etc. for practicing extensive reading.
- Outside of class, I download English learning materials from the Internet for later use.
- Outside of class, consciously or unconsciously I use computers and networks for autonomous English learning.
- Outside of class, I make use of search engines to look for English learning

materials for out-of-class study.

- (-) Outside of class, I seldom log onto English websites.
Outside of class, I watch English movies, listen to conversations and passages, practice dialogues, etc. on the Internet or other networks.
I plan the time I use for out-of-class computer-assisted autonomous English learning.
- (-) I have no interest in English learning websites.

2. The Use of Communicative Functions of Networks (5 items)

- Outside of class, I make use of computers and networks to exchange e-mails in English with e-pals for communication and writing practice.
- Outside of class, when confronted with problems, I consult the English teacher via e-mail in Chinese.
- Outside of class, when confronted with problems, I consult the English teacher via e-mail in English.
- Outside of class, I chat on the Internet and other networks with either native English speakers or other learners of English.
- Outside of class, when using e-mails for practice and communication, I attach more importance to meaning than to grammar.

3. ALL for Facilitating Classroom Study (3 items)

- Outside of class, I complete English assignments by collecting and downloading related resources with computers and networks.
- Outside of class, I get myself prepared for classroom study by reading related materials on the Internet.
- Outside of class, I submit my homework to the English teacher via e-mail.

4. ALL for Good Grades (3 items)

- Outside of class, I learn English autonomously by using CD-ROMs provided in compliance with college English textbooks to preview and review the course.
- Outside of class, I formulate plans to learn English autonomously with computers and networks to improve grades in the English course.
- Outside of class, I make use of the authentic and simulated test papers of National College English Test, TOEFL, IELTS, etc. on the Internet to help pass these examinations.

APPENDIX 2

Sample Interview Questions

1. As a Level 1 (or Level 2, Level 3) student, how did you plan your English language learning outside class this semester? Would you please describe in detail what you usually did in English learning outside class?
2. What role do you think computers and networks can play in your English language learning, particularly in your autonomous learning outside class?
3. What English learning activities did you engage in that were assisted by the use of computers and networks outside the classroom?
4. What difficulties were you confronted with in your out-of-class English study this semester? What measures or strategies did you take to resolve the problems?
5. What difficulties did you meet when making use of computers and networks in your out-of-class English learning? What strategies did you use to work out the problems?
6. How do you evaluate your out-of-class autonomous English language learning? How do you evaluate your out-of-class autonomous English language learning assisted by computers and networks?

APPENDIX 3**Descriptive Results of the Attitude Scale**

Attitudes	Level	N	Mean	SD
Overall attitudes	Level 1	108	3.33	0.39
	Level 2	115	3.38	0.36
	Level 3	106	3.55	0.44
Factor1 Advantages of computers and networks	Level 1	108	3.60	0.54
	Level 2	115	3.68	0.50
	Level 3	106	3.80	0.54
Factor2 Learning difficulties in computer-assisted ALL	Level 1	108	2.59	0.63
	Level 2	115	2.58	0.64
	Level 3	106	2.77	0.73
Factor3 General perceptions of ALL	Level 1	108	4.07	0.65
	Level 2	115	4.16	0.65
	Level 3	106	4.40	0.51
Factor4 Disadvantages of computers and networks	Level 1	108	3.12	0.59
	Level 2	115	3.19	0.70
	Level 3	106	3.32	0.78

APPENDIX 4**Descriptive Results of the Behavior Scale**

Behaviors	Level	N	Mean	SD
Overall behaviors	Level 1	108	2.45	0.62
	Level 2	115	2.42	0.56
	Level 3	106	2.73	0.53
Factor1 ALL via the Internet	Level 1	108	2.82	0.67
	Level 2	115	2.85	0.67
	Level 3	106	3.23	0.70
Factor2 The use of communicative functions of networks	Level 1	108	1.97	0.78
	Level 2	115	1.88	0.74
	Level 3	106	2.08	0.69
Factor3 ALL for facilitating classroom study	Level 1	108	2.21	0.74
	Level 2	115	2.26	0.70
	Level 3	106	2.84	0.73
Factor4 ALL for good grades	Level 1	108	2.39	0.82
	Level 2	115	2.18	0.73
	Level 3	106	2.17	0.71

APPENDIX 5

Correlations among Attitudes and Behaviors

	Overall attitudes	Advantages of computers and networks	Learning difficulties in computer-assisted ALL	General perceptions of ALL	Disadvantages of computers and networks
Overall behaviors	0.42**	0.35**	0.29**	0.34**	0.11*
ALL via the Internet	0.45**	0.40**	0.28**	0.36**	0.13*
The use of communicative functions of networks	0.26**	0.16**	0.22**	0.15**	0.11*
ALL for facilitating classroom study	0.34**	0.31**	0.22**	0.30**	0.03
ALL for good grades	0.16**	0.103	0.15**	0.20**	0.02

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

APPENDIX 6

One-way ANOVA Results for the Attitude Scale

Dependent Variable	(I) Level	(J) Level	Mean Difference	Sig.	Statistically significant differences between the two levels?
Overall attitudes	Level 1	Level 2	-0.99	0.651	NO
	Level 1	Level 3	-4.27*	0.001	YES
	Level 2	Level 3	-3.28*	0.010	YES
Factor1 Advantages of computers and networks	Level 1	Level 2	-0.56	0.608	NO
	Level 1	Level 3	-1.57*	0.025	YES
Factor2 Learning difficulties in computer-assisted ALL	Level 2	Level 3	-1.01	0.209	NO
	Level 1	Level 2	0.03	0.997	NO
	Level 1	Level 3	-0.72	0.143	NO
	Level 2	Level 3	-0.75	0.114	NO

Factor3	Level 1	Level 2	-0.26	0.558	NO
General perceptions of ALL	Level 1	Level 3	-0.96*	0.001	YES
	Level 2	Level 3	-0.71*	0.016	YES
	Factor4	Level 1	Level 2	-0.21	0.748
Disadvantages of computers and networks	Level 1	Level 3	-0.60	0.108	NO
	Level 2	Level 3	-0.39	0.381	NO

* The mean difference is significant at the 0.05 level.

APPENDIX 7

One-Way ANOVA Results for the Behavior Scale

Dependent Variable	(I) Level	(J) Level	Mean Difference	Sig.	Statistically significant differences between the two levels?
Overall behaviors	Level 1	Level 2	0.65	0.915	NO
	Level 1	Level 3	-5.48*	0.002	YES
	Level 2	Level 3	-6.13*	0.000	YES
Factor1 ALL via the Internet	Level 1	Level 2	-0.29	0.939	NO
	Level 1	Level 3	-3.72*	0.000	YES
	Level 2	Level 3	-3.43*	0.000	YES
Factor2 The use of communicative functions of networks	Level 1	Level 2	0.44	0.668	NO
	Level 1	Level 3	-0.54	0.558	NO
	Level 2	Level 3	-0.99	0.139	NO
Factor3 ALL for facilitating classroom study	Level 1	Level 2	-0.14	0.885	NO
	Level 1	Level 3	-1.89*	0.000	YES
	Level 2	Level 3	-1.75*	0.000	YES
Factor4 ALL for good grades	Level 1	Level 2	0.64	0.114	NO
	Level 1	Level 3	0.68	0.095	NO
	Level 2	Level 3	0.04	0.992	NO

* The mean difference is significant at the 0.05 level.