



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 19, 2021

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



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Mobile-assisted Autonomous English Learning in College Students' Extra-curriculum Time: A Case Study in China

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Abstract. With the growth of science and information technology in today's digital era, mobile-assisted learning is increasingly becoming an essential element in English learning for college students. In the context of the current construction of foreign language education in the new era, online autonomous learning is becoming a trend, especially in the anti-coronavirus stage. Moreover, how to provide adequate learning support for online autonomous learners is a research topic in the current education field. In response to this research gap, this study aims to investigate English-major students' mobile-assisted learning in Chinese engineering colleges. Based on the statistical study of surveys and online interviews in questionnaires, this paper explores the current state of mobile-assisted autonomous English learning in extra-curriculum time. The results show that English majors spend more time learning online with mobile devices and they need help with online learning. Further, this article provides suggestions on instructing English majors' learning.

Keywords. mobile-assisted language learning (MALL); autonomous learning; EFL learners

1. Introduction

Given the advancement of technology, technology-based language learning is increasingly playing an essential role in foreign language education. Educators and researchers have applied technologies to assist language learning and instruction for years. Many language researchers have shifted their attention from teachers' teaching to students' learning in the educational field. Mobile-assisted Autonomous English Learning is a hot topic in foreign language teaching undergoing intense study, becoming more popular on campuses. Many colleges and universities are implementing a modern paradigm for teaching English, where Internet technology is used to help learners learn autonomously. (Khoiriyah, K. 2020)

In particular, mastering English is even more critical for English-major students whose native language is not English for their academic life and for their prospective careers. More than two billion people speak English, rendering English the largest by a number of speakers and the third largest language by many native speakers. Without a good command of the language, students find themselves being unable to understand the underlying view or ideas that the authors try to convey in their scholarly papers (Macaro, E. 2020). Many students are required to write academic reports in English. Hence it is of great necessity for a good grasp of the English language. Meanwhile, the number of class hours per week of English learning is

sufficient in the curriculum for English-majors during the anti-coronavirus stage. Mobile-assisted autonomous English learning makes a useful supplement to traditional English teaching. It offers a large number of resources, breaks the constraints of time and space, and improves the students' learning abilities, especially the ability of autonomous learning in general for personal life-long learning and development.

With the arrival of this information age, almost all college students own their laptops and mobile devices. The university teaching buildings, classrooms, dormitories, and campuses are all covered with a wireless network signal, which is very convenient. However, the weakening of teachers' role in online learning and the weakening of teaching management, the disorder and randomness of the vast amount of information, and the organization of information on the Internet can easily lead learners to "information trek" and "information overload." The online learning environment requires learners' higher autonomous learning ability, and it is of urgency to provide real and practical learning support for online autonomous learners. Based on this situation, research is carried out to investigate the current situation and existing problems of the MALL-based autonomous English learning of English-major students. Furthermore, suggestions are proposed to improve English-major students' capability of autonomous English learning.

2. Literature Review

One of the earliest and most famous distinctions related to technology learning in language learning was introduced by Warschauer and Healey (1998). They identified three phases of CALL, which are behaviouristic, communicative, and integrative CALL. A few years later, Warschauer (2000) made some changes in these phases' names and dates, as shown in TABLE 1 below, which also summarizes the three phases of CALL.

Stage	1970s-1980s: Structural CALL	1980s-1990s: Communicative CALL	21st Century: Integrative CALL
Technology	Mainframe	PCs	Multimedia and Internet
View of language	Structural (a formal structural system)	Cognitive (a mentally-constructed system)	Socio-cognitive (developed in social interaction)
Principle use of computers	Drill and practice	Communicative exercises	Authentic discourse
Principle objective	Accuracy	And fluency	And agency

TABLE 1. Technological phases of CALL (adapted from Warschauer 2000)

2.1 Mobile-assisted language learning

Learning languages through mobile devices are generally referred to as mobile-assisted language learning (MALL), a subset of CALL and indicate that language learning is "based upon the use of mobile devices", such as smartphones, MP3 players, and tablets. The role of mobile devices in language learning has attracted more and more attention over the past few

years. This is believed to be due to the constant technological progress and the increasing use of mobile devices, which are commonly considered to have great potential in language learning. Among these, mobile phones are the kind of technology that has received the most attention from educators mostly because they cost less than computers but still have many useful functions, such as access to the internet and internet browsers (Stockwell 2010). It is believed that “MALL differs from the computer-assisted language learning in its use of personal, portable devices that enable new ways of learning emphasizing continuity or spontaneity of access and interaction across different contexts of use.” Generally, it is argued that MALL presents two main advantages in comparison to learning through traditional computers: portability and the capacity to interact with the surroundings (F., and Murray, L. 2016). Mobile devices “can be carried around at any time of the day, including to non-learning locations, meaning that they can be used at any time.” They enable their users to interact with the surroundings, thanks to the global positioning systems often incorporated in them.

Regarding language learning, MALL gives learners the chance to access authentic learning materials from any place and at any time and use the target language in authentic situations, such as checking the menu on a restaurant website in the target language. Access to online content can also occur through mobile applications (apps) designed to help learners practice their language skills. For example, Nami, F. (2020) carried out research showing the potential of language-learning apps for both students and teachers. Furthermore, Nielit, S. G. and Thanuskodi, S. (2020) suggest that the most considerable difference between mobile devices and desktop computers is that “the primary function of mobile devices has been for personal and social purposes, as opposed to work or study purposes.” Therefore, the presence of personal and social apps on mobile devices, such as apps for communicating with others (for example, Facebook and Twitter), may give learners the impression that such devices are not suitable for learning.

Furthermore, mobile phones’ limited screen size and the distracting environments where they are commonly used may deteriorate the learning experience (Lin, J. J., and Lin, H. 2019). However, it can be claimed that the social feature of mobile phones can also benefit language learning. Considering that MALL enables learners to communicate with other people anywhere and at any time, it can be argued that interaction with speakers of the target language through mobile devices is more straightforward and has the potential of enhancing language learning.

2.2 Learner Autonomy

Autonomous learning has been a hot topic in foreign language education in recent decades, especially in lifelong learning skills. Typical activities in the language classroom have been transformed. Self-access language learning centers (SALCs) have been developed around the world, such as the SALC at the Kanda University of International Studies in Japan, the Arthur Samy Language Learning Center (ASLLC) at the Hong Kong Institute of Education, the Self-Learning Center (SAC) at the Hong Kong University of Science and Technology. As a result of such practices in language learning, teaching is now often considered to be of equal weight as learning, and the learner has been put at the center of focus in some areas.

Learner autonomy is generally recognized as an essential element in language learning, and for many years, second-language scholars and practitioners have paid a great deal of attention, such as Lenkaitis, C.A. 2019). 2019. Autonomy can take different ways and varying degrees depending on the individual learner and the learning environment to facilitate forms. Henry Hollerk invented the term “learner autonomy” for the first time. His concept of “the ability to take charge of one’s own learning” (Holec 1981) offered a theoretical basis for future study. Later on, several definitions of the word have been given, depending on the speaker, the

context, and the debate level that educators have risen to. Among these different meanings, it has been regarded either as a personal human characteristic or a political or educational practice. While independent studies emphasize independence and self-regulation, they are not the same as self-study or self-study. Instead, it focuses on embarking on a self-directed learning journey in which learners take the initiative, track development, and assess individual learning outcomes.

In order to explore the field of autonomous learning, Tassinari(2011) developed a complicated model that combines the cognitive, metacognitive, social, and emotional aspects of learning autonomy. This model suggests that learners develop their learning comprehension through self-assessment and self-reflection of the learning process. Teachers need to use constructive techniques to minimize anxiety and enable learners to control pressure and emotions to develop their own. Teachers, as professionals, play a crucial role in directing, tracking, and assessing the learning process in order to promote students' autonomous learning skills.

Attitudes towards autonomous learning have been studied as a psychological characteristic to analyze the way learners develop their autonomy. A multidimensional construct was put forward to investigate students' attitudes toward Autonomy English Learning utilizing a questionnaire study. The scholars found that a learner's attitude towards autonomous English learning might affect language learning outcomes by the learner adopting strategies for learning. Many studies have been conducted to effectively engage learners in autonomous learning and improving their autonomous learning capability.

With the rapid growth of computer technology and the popularization of the Internet, researchers both within and outside China have explored digital technology's introduction to the language learning process. However, very few studies have focused on mobile-assisted autonomous English learning of students in engineering college, in particular English-majors to whom English is disparately essential compared with some other non-English majors. A multidimensional construct was put forward to investigate students' attitudes toward autonomous English learning in their extra-curricular time utilizing a questionnaire study.

3. Research Design

To find out and get a general idea of the current status of English-majors' autonomous English learning behavior amid the MALL environment, 21 students participated in the research, with a total of 22 questionnaires distributed, and one was invalid. Using a range of approaches for gathering qualitative and quantitative statistics, with questionnaires as a tool for collecting quantitative data, a follow-up interview for collecting qualitative data, to make the experiment as realistic and convincing as possible. The data from the online questionnaires were analyzed through the inline analysis tools. Besides, the author interviewed five students who had participated in the questionnaire investigation to get a further understanding of questions from various perspectives; the interviewees volunteered to participate in the investigation.

This article aims to investigate the autonomous English learning behavior of English-speakers using computer networks and to explore the effect of MALL views on autonomous learning and the effect of external factors such as extracurricular learning time on this behavior.

3.1 Research Questions

The purpose of this research is self-explanatory, and it mainly concerns four questions as follows:

1) What is the current situation of college students' computer literacy, web device, and network popularity?

2) What are students' attitudes toward MALL and existing problems of students in their process of mobile-assisted autonomous English learning?

3) What are the specific learning instruments for autonomous English learning, and what can be done to improve English-majors' mobile-assisted autonomous learning?

3.2 Research Background and Research Participants

Currently, the development of learner autonomy has been a priority for college English teaching in China. A large number of college students were equipped with personal computers during the normalization of online classes during the COVID-19 pandemic from February to date.

The research implement and data collection were conducted in early June 2020. At that time, the participants took online courses in dormitories. They volunteered to take the survey and interview. The 21 participants in this study are from an ordinary college with distinctive characteristics, located in East China. The participants are from different regions of China and are characterized by different educational backgrounds that lead to different thought patterns, cognitive styles, experiences, and opinions. English is their major at the university, a compulsory course, and participants have gained a strong knowledge of listening, speaking, reading, and writing. By the time they were invited to finish this investigation, they had studied English for years and had passed College English Test Band Four, which is the reason chosen them as the research participants. All participants in the questionnaires and interviews for quantitative and qualitative research are chosen randomly and straightforwardly.

3.3 Research Instruments

To obtain more reliable information, the author uses two kinds of instruments: questionnaires and interviews, which are common and frequently used survey tools to obtain a large amount of information from a large number of people in a relatively short period.

A questionnaire survey was selected as a method for investigating the views of students and instructors. The following explanations were used to evaluate this decision. On the one hand, within the restricted timeframe of the analysis, the questionnaire survey approach helps the researcher collect more data than possible in a one-to-one interview. (Dörnyei, 2007). On the other hand, the questionnaire survey helps validate the research study and make it more reliable.

The questionnaire was designed to reflect the goals of the study. To ensure an accurate understanding of the items, the questionnaire was written in Chinese, the native language. Twenty-one valid questionnaires have been collected. These questionnaires are collected online and analyzed by technological tools.

The questionnaire consists of three parts:

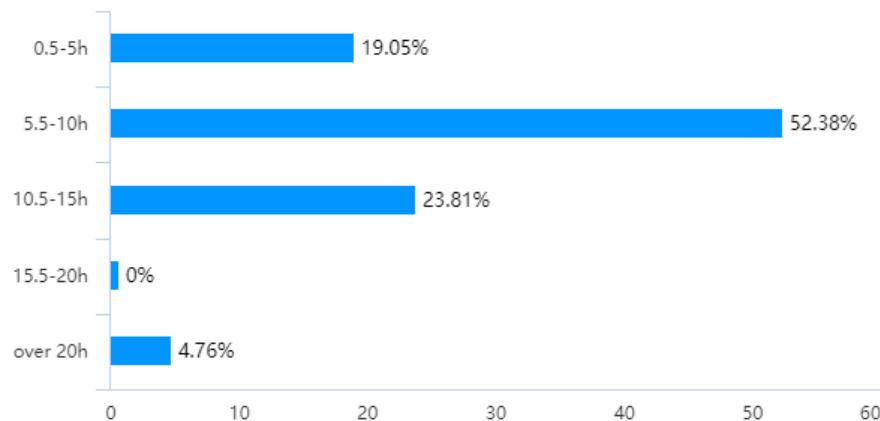
1) Understand the participants' necessary information, including gender, English level, extracurricular study time, and weekly extracurricular English time;

2) Investigate the view of MALL for English majors;

3) Investigate the autonomous learning behavior of English-majors using mobile phones.

Except for personal information, all options are graded in the form of the Likert scale, ranging from "strongly opposed" to "strongly agreed." Likert scale is a commonly used scales for rating and summation. The questions use a 5-point scale, sometimes referred to as satisfaction scales ranging from one extreme attitude to another. Each survey question includes a moderate or neutral option in its scale. Items belonging to the same construct are scored by summation. The Cronbach alpha coefficient of the MALL view scale in the questionnaire is 0.867. The extracurricular autonomous learning behavior scale is 0.910. The internal consistency of the two-scale designs is highly reliable.

The interview is a structured conversation in Chinese, where the interviewer asks



questions, and the other provides answers. After data collection through the questionnaires, 5 out of 21 participants were randomly invited for interviews in their spare time to obtain more in-depth information and further prove the findings. Interviewees were allowed to speak Chinese, which makes them more comfortable to share their ideas. The interviews aim to investigate the specific situation of internet instruments they use.

4. Results and Discussion

4.1 The Basic Data of Questionnaires

Data collected from questionnaire entries (Lickert scale, multiple choice) were entered on and analyzed with a professional questionnaire survey platform, So jump. (<https://www.wjx.cn/>) The questionnaire's first part indicates of all 21 participants, 19.05% are males, and 80.95% are females. It conforms to the fact that very few boys choose English as their major in Chinese engineering colleges. The data shows that most of the participants assess themselves at an ordinary level. It conforms to the modesty of the Chinese people, regarding modesty as a virtue.

TABLE 2 shows the time of autonomous English learning per week in their extra-curriculum time. 52.38% of the participants take 5.5 hours to ten-hour per week to study English with mobile-assisted techniques. Only one student takes more than 20 hours per week to learn English, which accounts for 4.76%. Although many college students say they are very busy with their school classes, they manage to spare several hours a week to learn English assisted by mobile phone.

TABLE 2. The time of autonomous English learning per week

Results about other research questions and objectives are presented below.

4.2 The Views of MALL

In the views of schools, teachers, and researchers, the Internet can provide a large amount of real language information and create environments and opportunities for real language use. It can build a bridge between learners and teachers, classmates, and the outside world and enable learners. According to people's needs, preferences, and time, choose the appropriate learning content, progress, and methods. Its multimedia, interactive features that incorporate text, sound and images will increase the interest and excitement of learners. However, how do English-major learners (EML) view MALL? TABLE 3 is the survey results of the students' MALL view.



	The views of MALL in the eyes of EML	Number of participants	Average of Likert scale
C03	NEW APPROACH FOR EXTRA-CURRICULUM LEARNING	21	4.29
C04	LEARNING STRATEGIES	21	4.1
C05	THE CONFIDENCE OF MALL	21	3.71
C06	LINGUISTIC ENVIRONMENT	21	3.9
C07	ENJOYMENT; FLEXIBILITY	21	4
C08	KNOWLEDGE OF CULTURAL BACKGROUND	21	4.43
C09	SENSE OF ACCOMPLISHMENT	21	3.57
C10	THE PRIORITY OF MALL AUTONOMOUS LEARNING	21	3.71
C11	THE IMPORTANCE OF TEACHER'S INSTRUCTION	21	3.86
C12	THE IMPORTANCE OF REFERENCES	21	3.86
	TOTAL	21	3.943

TABLE 3. The views of MALL in the eyes of EML

Overall, undergraduate students have an excellent mindset to CALL, with an average value close to 4. Students understand the importance of English learning environment and methods, strategies and believe that MALL can make English learning more flexible, provide more comprehensive information input, and help understand cultural background knowledge. Simultaneously, they also recognize the new ways provided by the computer network for English learning. In addition to collaboration and encouragement for language learning environments, there is an abundance of accurate English knowledge and a wide variety of learning materials. Get teachers' advice, guidance, and help. It can be seen that postgraduates agree with the benefits and advantages of objective mobile-assisted language learning. However, as the main learning body, they have low confidence in using computer networks for autonomous English learning and lack positive psychological experience and feelings.

This aspect may be due to the insufficient risk awareness of the students. On the other hand, it also reflects that the graduate students have not been sufficiently psychologically prepared to use the computer network for autonomous English learning.

4.3 Mobile-assisted Autonomous English Learning Behavior of EML

EMLs' autonomous English learning behavior assisted by networks can be divided into three categories:

- 1) Browse English learning or information websites to obtain learning materials skill about listening, speaking, reading, writing, and translating;
- 2) Use various websites and applications for skill training or testing;
- 3) Use the communication bridge built by the network to communicate with classmates, teachers, native English speakers, or other English speakers. The survey results are shown in TABLE 4.

	EML's learning behavior	Number of participants	Average of Likert scale
SC11	BROUSE ENGLISH LEARNING AND INFORMATION WEBSITES	21	3.71
SC12	ONLINE READING AND WATCHING AUDIO-VISUAL MATERIALS	21	3.9
C13	USE SEARCH ENGINE FOR LEARNING	21	3.6
C14	VIEW MORE ENGLISH WEBSITES THAN CHINESE WEBSITES	21	2.6
C15	CHAT ONLINE IN ENGLISH	21	2.71
C16	ONLINE CONSULT ENGLISH TEACHER	21	2.53
C17	DO ENGLISH PRACTICE ONLINE	21	3.6
C18	USE ONLINE ENGLISH DICTIONARY	21	4.51
C19	DOWNLOAD ENGLISH MATERIALS OR PRINT	21	4.3
	TOTAL	21	3.495

TABLE 4. EML's learning behavior

Results show that the frequency of EMLs' autonomous English learning behavior based on the mobile phone is not very high (3.495). Students are better at providing English learning materials on the Internet, using search engines to find and obtain relevant learning materials. However, they tend to browse Chinese websites when surfing the Internet and seldom consciously enter English websites to strengthen English learning. Students rarely use interactive English learning CDs and rarely use CDs to learn English or test English proficiency. The utilization rate of the dominant communication function of the network is also shallow. It is rarely used to send emails, chat, or discuss on the Internet in English. When encountering problems, almost no emails are sent to English teachers. Besides, students lack the management and monitoring of autonomous English learning using computer networks and are easily

learning and think it is essential to learn English autonomously. They believe the web environment is useful for them to learn English. Although only a small number of students are currently engaged in web-based autonomous English learning, they utilize their means of learning English, such as online tools, English language movies, and membership on English-learning websites. Lastly, most students expressed their willingness to learn to use web-based English learning tools and expert guidance from their English teachers. In terms of the influencing factors, most EMLs believe that weak motivation, lack of efficient learning strategies, and the emphasis on traditional teacher-centered teaching are the major factors that hinder them from mobile-assisted autonomous English learning.

Through the collation of interview data, students' main difficulties include too much online temptation, low self-control, and inability to concentrate. Moreover, they face unskilled computer operation, which affects the learning process, lack of practical learning method guidance for online autonomous learning, and lack of adequate supervision mechanisms.

In response to these problems, students also put forward their expectations: to improve self-control and resist Internet temptation; teachers give practical guidance on learning methods: provide more and better English learning websites. It can be seen that the analysis results of qualitative data have confirmed and supplemented the quantitative analysis to a certain extent, and also more intuitively guided our educators to make a profound reflection on the current computer-assisted college English teaching.

5. Conclusion

All in all, based on the significant findings of this research, English majors highly value mobile-assisted English learning, and they spend more time learning online. We have identified the main problems faced by English-major students in their process of mobile-assisted autonomous English learning. They lack efficient learning strategies and emphasis in the self-directed mode. To solve these problems, suggestions and possible solutions are developed as follows:

Firstly, to have a better learning environment. Many students seldom interact with their English teachers during or after class. Autonomous learning does not imply learning on its own. Interaction and cooperation are also required (Tseng, W. T., et al. 2020). It is well known that abundant resources exist on the Internet. However, navigating through these vast resources and effectively utilizing them is not an easy task. So it would be helpful to form learning teams under a teacher's guidance to improve interaction and cooperation and further establish an effective and efficient learning environment.

Secondly, stimulate student's motivation. Learner's motivation is an essential factor affecting the learner's performance. Studies suggest that autonomous learning is closely related to learner's motivation. Based on the findings that some students have low motivation to learn English autonomously through the Internet, specific measures should be taken. Students should be made more aware of the advantages of mobile-assisted autonomous English learning through more exceptional communication. They can determine their learning speed according to the English level and enjoy more freedom in the learning process.

Some students lack interest in English learning due to the confined nature of the learning materials. The content in the typical textbook is designed for all the students in the school, whereas the Internet provides a wide variety of learning materials for students to select as they see fit (Kuncoro, R. Y., and Triastuti, R. 2020). In order to stimulate students' interests, learning materials should not necessarily be confined to textbooks. Newspapers, English movies, short stories, and specifically learning materials are suitable for mobile-assisted autonomous English learning.

Thirdly, change teacher's traditional role and guide students' mobile-assisted learning. Many students have become accustomed to the traditional model of English teaching. They overly depend on teachers but seldom depend on themselves or show any self-initiative, which results in their poor autonomous learning ability (Mugan, J., and Kuipers, B. 2011). Both teachers and students should shift consciousness about their roles in the learning process and transfer the more substantial part of the responsibility for learning from teachers to students to develop students' autonomous learning habits.

Fourthly, provide training programs. Training students in learning strategies is significant. In order to lead the students to become more autonomous and more independent, it is necessary to conduct some learning strategy training for the learners. Students should be trained in computer skills to facilitate the improvement of their language skills by using mobile devices or other learning tools.

Funding

This work was supported by Postgraduate Research & Practice Innovation Program of Jiangsu Province of 2020.

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