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Research Article

On Effective Utilization of Computer-Mediated Communication Technology in Network-Based Foreign Language Teaching

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The integration of computer-mediated communication and language teaching has been a common practice in the higher institutes internationally. The effective application of computer-mediated communication (CMC) in network-based foreign language teaching depends on the optimal balance between the use of teaching methods, teaching sources, and teaching means in a specific learning environment. Based on the current literature research on CMC, this paper mainly introduces the CMC in foreign language learning from its time characteristics, compares the language generation under synchronous and asynchronous CMC, and discusses and analyzes the setting of teaching tasks and the application of CMC in teaching practice, as well as the possible technical availability problems.

1. Introduction

The main goal of foreign language teaching is to cultivate students' autonomous learning ability, expand their knowledge, improve their social and cultural awareness, and improve their language creativity. Specifically, besides mastering grammar, there are also other aspects of language learning, such as pronunciation, vocabulary, discourse, and semantics. Therefore, successful language teaching requires a balanced teaching method that imparts a lot of language knowledge, considers all aspects of language learning, and meets the needs of different learners.

Any teaching method has its limitations if it cannot take into account different language aspects like the form, accuracy, fluency, and meaning of the language at the same time. The listening and speaking approach proposed in the 1970s and the communicative approach proposed in the 1990s cannot achieve the goal of language teaching balance.

As a matter of fact, it is not easy for foreign language teachers to consider the above factors when designing course plans to achieve the optimal balance. According to students' learning objectives and available resources, three basic factors should be considered the nature of language learning, teaching methods, and teaching means [1]. Therefore, language teachers need to understand the advantages and limitations of different computer-mediated communication technologies to find a teaching method that can solve the problems related to different aspects of language, meet different needs and learning objectives of learners, and adapt to different resources and technical conditions. To achieve such a balanced method, teachers must learn to introduce technical resources into classroom teaching and fully combine it with face-to-face classroom communication between students, teachers, and students.

The research on computer-mediated communication (CMC) is not only emerging in the literature of applied linguistics but also becomes a hotspot in the field of computer-assisted language learning (CALL). CMC refers to the network communication supported by computer technology [2]. It is an extensible virtual reality environment through a network connection and multiuser participation, and the communication in this environment is based on the text [3]. Compared to network-based language teaching, CMC has a broader concept, including various forms of network use and online resources, such as online newspapers and teaching aids [4]. At present, e-mail and chat are the most

widely used network communication technologies in language learning, as well as MOO (A MOO is a text-based, multiparticipant, user-extensible, object-oriented virtual environment in which users can interact with each other via the Internet both synchronously and asynchronously [5]), real-time conference, audio-video conference, mobile learning platform, etc. The trend of integrating CMC into foreign language teaching is reflected in some professional terms emerging in recent years, such as online learning, e-learning, internet-based learning, web-based language teaching, network-based collaborative interaction, web-based language teaching and learning, and telecommunication cooperation [6].

There are many types of technologies that can be used in online classrooms, and their functions are not the same. For example, e-mail and online chat have completely different properties, and they have different effects on language learning. Negretti (1999) pointed out that "Different network technologies have different effects on the acquisition of different learning skills." [7]. Therefore, when considering the value of classroom face-to-face interaction and any form of interaction mediated by the network, "balance" is the most basic factor. Sotillo (2000 : 83) claimed that "For those teachers who are clear about their teaching objectives and steps, online guidance is better than face-to-face teaching. In terms of the time required to complete the task, synchronous online communication seems to be more efficient than ordinary classroom communication. In such an environment, students will have more opportunities to generate more complex language because teachers have less control over students' discussions." [8].

Although the benefits of online foreign language learning are widely recognized, and some students prefer online classroom teaching, the problems it brings should also be considered, especially the complexity of language and language learning, as well as the diversity of students' learning objectives and learning strategies. Thus, teachers should make careful choices in curriculum design, create an effective network teaching environment, and coordinate the relationship with traditional classroom teaching so that the coordinated development of teaching is guaranteed.

Although it is not determined whether the technological innovation brought by CMC will bring about the "paradigm shift" of second language teaching, the research in this field deserves researcher's attention, e.g., the research focuses on exploring the theory of second language acquisition or focusing on the project (such as telecommunication cooperation) combining with the practice of foreign language teaching. Compared with the research and practice in the CMC field abroad, the research in this field in China is relatively preliminary and needs to be deepened. Based on the time characteristics of the CMC technology in language teaching, this study is aimed at comparing the differences in language generation between synchronous and asynchronous communication modes and discuss how to achieve the optimal balance between CMC characteristics and the language teaching objectives in a CMC-based language teaching environment. It should be noted that this study only focuses on the communication technology in the process of language learning, i.e., it only discusses how to use the network as a communication tool, not as a tutor, or as a kind of resource that can provide real corpus.

The integration of CMC and the language teaching has been a trend in the higher institutions. Since the COVID-19 pandemic has still been a troublemaker to the way of language teaching, CMC will play its significant role in assisting the blended teaching. This study will help the stakeholders to figure out the language generation between synchronous and asynchronous communication modes in a CMC-based language teaching environment.

2. CMC Technology in Language Learning

The CMC technology is developed around its characteristics in time, space, social culture, and individual. The time refers to whether the communication is synchronous or asynchronous [9]; the space refers to the virtual space in active worlds, where the simulated three-dimensional space environment can be used for language learning; the equipment includes the size and mobility of the video screen, the readability of the web page, and the size of the window. For example, all types of communication and contact can be realized through the small screen and keys of the mobile phone; as for the characteristics of social culture, there have been extensive discussions, such as the culture and behavior patterns generated by a specific communication technology [10]; individual differences include personal background and personal preference for particular communication technology and its reasons. All these characteristics of the CMC technology are worthy of attention, and this paper will focus on the time characteristics of network language teaching.

2.1. "Real Time" in Network Language Teaching. Whether there is a delay in the process of information transmission, network communication can be divided into synchronous (real-time) communication and asynchronous communication [11]. Students participating in network chat communication will find that their thinking and reaction must be very fast, especially when there is a large number of students. However, when communicating through e-mail, the students have more time to think about what they have written before sending back the message. This type of gap in response time is the deepest experience of students when they use the CMC technology for language learning. Therefore, synchronous communication (such as online chat and face-to-face communication) will be faced with the pressure of real-time processing language for students. More and more theoretical and observational evidences show that the length of interaction time allowed by a certain technology mode will directly affect language learning based on this technology [12].

From a cognitive point of view, human attention is limited and selective and is only partially controlled by themselves. Therefore, how to make students focus on language learning tasks is essential.

At present, there are two different opinions on the essence of psychological expression systems: the regular generated system based on rules and the idiom system based on

samples (a large number of programmed memories that can be activated quickly) (these two systems are referred to as regular generated system and idiom system in the following). Skehan and Tong believed that the two systems can be combined dynamically and interactively [13]. He thinks that the regular generated system and idiom system are coexisting. The former "calculates" or generates sentences by compressing the memory storage and the language generation rules at the same time, while the key of the latter is a large number of redundant memories, and most of the memories are about chunks rather than single sentences [13].

Concerning the two systems, Skehan and Tong believed that the role of the regular generated system based on rules in language learning has been exaggerated, and the idioms system actually has more potential. When time is limited, students can gain time through the formulaic "prefabricated chunks" formed by the memorized language. That is, the idiom system can be used faster than the regular generated system, and the latter needs more time to "calculate." When there is plenty of time, students can choose between the two systems, but when time is limited, students tend to seek a less complicated system. Meanwhile, Skehan and Tong also mentioned that when solving real-time problems in actual communication, students will adopt a lot of "creation time" expressions as communication strategies (e.g., repetition, ellipsis, and lexical stemming) for continuing interaction and controlling language [13].

2.2. Language Features in Synchronous Network Language Teaching. In the process of synchronous network language learning (e.g., chat conversation and various synchronous levels of language communication in the network environment), time will cause pressure on students to process language in real-time. Therefore, the students will rely on more communication strategies and the idiom system than the regular generated system.

Besides, linguists also note that incidental vocabulary negotiation plays a dominant role in synchronous internet-based language learning, while syntactic negotiation is rarely used, which confirms the advantages of synchronous web-based communication in meaning negotiation.

Schwienhorst studied the role of "repetition" in synchronous network communication, and he found that using "repetition" can also save time [14]. However, in the MOO environment, technically, it is unnecessary to ask the other party to repeat because the previous text information can be accessed at any time. However, psychologically, this demand for repetition is not unnecessary because people still tend to use repetition to delay time when interpreting the previous discourse.

In addition, idioms are also very common in the context of synchronous network communication. Toyoda and Harrison pointed out that a large number of fixed expressions are crucial for the progress of explanation clarification and confirmation [15]. Garcia and Arbelaiz also described students' repeated use of a certain type of idiom and other chunks [16]. When students begin to learn the language, they can start from learning concise chunks and idioms, which can save time and effort when typing (such as "what is x?" It is the simplest way to ask for the definition of a word). When the time of synchronous communication is limited, the use of chunks or idioms becomes the most effective and efficient way. In short, under the background of synchronous communication in online classrooms, there are some specific types of languages and strategies favored by students, which are characterized by the frequent use of communication strategies and idioms. Meanwhile, students are mainly engaged in lexical negotiation rather than syntactic negotiation. Therefore, in this context, students prefer language meaning and fluency to language accuracy and language form.

2.3. Balance of Teaching Objectives in Network Language Teaching. The ultimate goal of online foreign language teaching is to find a balance between the goals of language learning (e.g., understanding the meaning or form of language), the acquisition of accuracy and fluency of language, and the learning of grammatical structure. Since synchronous CMC will put pressure on learners in terms of time, students may pay less attention to language form, accuracy, and complexity. To overcome these shortcomings, teachers need to consider and arrange the design of learning tasks, the arrangement of the learning sequence, and the choice of communication technology [17]. For example, asynchronous CMC technology can be used to promote students' learning of language forms, and sending of e-mail does not require students to process language immediately.

The characteristic of the network CMC technology is that whether the communication is synchronous or not, its mode is not controlled by the design of teaching tasks [18]. Therefore, teachers can change the design of tasks anytime to achieve a specific teaching goal. Meanwhile, teachers can choose an appropriate communication technology for different teaching tasks: if the goal of the task is to learn the meaning of language and acquire the fluency of language; then, teachers should choose the corresponding CMC technology that matches this goal should be chosen, such as synchronization technology; if the goal of the task is to learn the language form and emphasize the accuracy and complexity of the language; then, teachers should choose asynchronous network communication technology or organize a postsynchronous classroom activity focusing on the language form. Because MOO supports both synchronous and asynchronous communication, it can be used as a single network environment to achieve language meaning and form a learning method.

3. Comparison of Language Generation between Synchronous and Asynchronous Network Communication Technology

The abovementioned language learning methods based on the CMC technology come from two types of synchronous communication contexts: online chatting and synchronous MOO. Schwienhorst (2002) claimed that MOO space is

not suitable for training the accuracy of dialogue, but it provides an environment and a real-life space for the fluency training of dialogue [14]. Weininger and Shield believed that the MOO environment provides students with the opportunity to acquire fluency in the spoken register, and its synchronicity provides a rich medium for students' oral training [19]. Thus, the communication based on synchronous network communication technology, e.g., the communication in face-to-face classroom teaching, is more conducive to the acquisition of language fluency and the training of meaning understanding.

Compared with the synchronous network communication technology, the role of asynchronous communication mode (e.g., e-mail) in language learning is less studied, especially the comparative study. One of the reasons may be that the comparative study involves many variables [20].

The latest research is a comparison between the two communication modes by Crystal [3]. By investigating the second language output under two different modes of the CMC technology, i.e., synchronous and asynchronous, and through the classroom teaching of English as a second language writing course, Crystal explored the function of discourse and the complexity of syntax [3]. The research contents include "What are the qualitative and quantitative differences in the functions of context between synchronous and asynchronous discussions when completing reading tasks?", "Which synchronous network communication mode produces more complex syntax?" The results are as follows:

(i) *Quantity Aspect*. The function of context in asynchronous discussion is poor than that in synchronous conversation

(ii) *Qualitative Aspect*. The delay characteristic of asynchronous discussion makes students' syntax more complex

It can be seen that synchronous and asynchronous network communication technologies have different influences on students' language production and learning, and they can be used for different teaching purposes [3].

Crystal has also noticed that when students communicate synchronously, they seem to pay more attention to the meaning of the language and ignore the accuracy of the language; by contrast, those who communicate asynchronously have more time to prepare the answers, like checking the spelling and pronunciation, although many students still use incomplete sentences and wrong spelling when writing asynchronously [3]. The researcher emphasized that although the asynchronous network media communication mode gives students more time to think, it does not mean that students will automatically give more lasting attention to the accuracy of language. Through extensive observations, it is found that in the process of e-mail exchange, students are rarely interested in editing what they have written, and only when they need to post it on the network bulletin board (BBS) will they pay attention to the accuracy of language [3].

As a matter of fact, the e-mail itself, as a medium, does not help students to use grammar and vocabulary accurately. Since the communication outside the classroom is generally informal, and the research was not designed for second language learning at first, it should be understood that the CMC technology is not designed for specific teaching objectives. Thus, only when teachers set teaching norms and models around the CMC technology and help students use technology correctly to achieve the purpose of language learning can the second language be acquired.

4. Combined Application of Teaching Task and Network Communication Technology

If it is impossible to consider both the form and meaning of language (i.e., the fluency and accuracy of language) and the complexity of grammatical structure required by teaching objectives, it is necessary to focus on the arrangement of classroom teaching tasks and the choice of communication technology [21]. Since each teaching task and the CMC technology have different effects on students, to maintain the balance of all aspects in the process of language learning, teachers must pay attention to the choice of task and technology at the same time.

The above discussion indicates that synchronous network communication technology can help students pay attention to the meaning and fluency of language. Therefore, the task-based teaching framework constructed by Willis (1996) can be used in task-based teaching, and task-based classroom activities can be recorded and analyzed to evaluate the completion of tasks [22]:

(i) *Before the Task*. The content of the task is determined by the teacher

(ii) *When Students Complete the Task Cycle*. Work in pairs and report to the whole class

(iii) *After the Task*. Students learn from others how to complete the task. Teachers summarize new language points and organize students to practice

In the whole framework, the position of the whole task must be determined first. The content of the task should contribute to the fluency of the target language and the learning of communication strategies. The goal of the task is to focus on the meaning of the language rather than the form. Also, the design purpose of the posttask stage in this framework is to promote students to focus on the meaning, accuracy, and form of the language at the same time to balance different aspects of language. Note that task completion should not be regarded as the only purpose of language learning; otherwise, it will bring many problems, such as overemphasizing the use of communication strategies and lexical chunks while neglecting the accuracy of grammar and language. Meanwhile, if teachers want to know the synchronous language behavior of students when they complete the task, teachers can ask students to write a report on classroom interaction or make oral summaries and statements to the whole class.

At present, many studies on teaching tasks have been designed to train students' fluency, accuracy, and complexity of second language output. For example, in the article "Cognition and Tasks" [23], Skeha and Forster divided pretask activities into teaching activities, implicit learning activities, demonstration activities, and awareness-raising activities, all of which can be regarded as classroom teaching tasks based on the CMC technology [24]. The results show that pretask planning can strengthen the complexity and fluency of language, help students to learn grammatical structures, and improve the accuracy of language.

The advantage of communicating through synchronous network technology (such as chat and MOO Seminar) is that language communication can be easily recorded in the form of a log. The chat seminar itself is instantaneous and dynamic, but the log can provide a reliable reference for future discussion and analysis and guide students to pay attention to the form and accuracy of language.

In addition, by participating in the MOO exchange study, students can meet with the teacher and analyze the log together to find out the mistakes and learn how to use the language correctly. These activity records can eventually form a profile for students' learning (including the content they learned through MOO). Based on this, teachers can better understand classroom activities and the use of recorded materials, and students can more accurately expand and grasp the vocabulary.

Finally, it should be noted that to achieve the purpose of accurate use of language, the log text is only a form of recording online tasks for posttask analysis in the future. Teachers can also record the students' activities completing network tasks through video recording, e.g., one channel records the computer screen immediately, and the other channel records the students' conversation when they complete the task. Any online task, whether in text or in audio-visual, can be recorded in this way for future analysis.

5. Possible Problems in Teaching Practice: The Availability of Technology

The characteristics and forms of different CMC technologies will cause the problem of technology availability: how does the CMC technology guarantee or restrict students' communication and interaction in network teaching. To make this point clear, it is necessary to understand the main differences between IRC (Internet Relay Chat) and ordinary conversation:

(i) Participants can only take turns to type what they want to say in the dialogue box and press enter to continue the conversation

(ii) The opportunities for online people participating in the dialogue are allocated by the server, and there will be a time lag

(iii) The process of language production (typing) and speech (sending) are not synchronized, and the temporary appearance of others will interrupt the sequential relationship of the interlocutors

(iv) The dialogue is conducted on the scrolling window of the monitoring screen. In this case, when the server is busy, the speaker wants to communicate with the former, but the other person is already scrolling on the screen

Before replying to dialogue, students should first read the online dialogue then decide whether to join a dialogue or respond to a conversation and finally type in what they want to say in the dialogue box. The speed of students' response to the dialogue depends on pondering, typing speed, the length of the response, and whether the students edit what they want to say. As the content of the dialogue moves on the screen until it disappears, the initial prompt may disappear from the screen in the students' response process. Only when the students complete the content of the message and press enter to send it can the message reach the server. Therefore, the causes of students' conversations, dialogue boxes, typing speed, server speed, and the sense of time urgency brought by dynamic conversations will affect the sending of the final message.

In addition, though the information sent by synchronous network communication or electronic communication is complete, it is one-way. To ensure the continuation of dynamic communication, it is necessary to often show that the information sent is incomplete. Also, online editing needs to edit the appropriate text in a very short time.

To sum up, in the network relay chat or similar context, due to the mechanism characteristics of technology processing and sending information, there will be different constraints [25]. Therefore, to use a specific CMC technology for language teaching, the purpose of teaching should be determined first, and the characteristics of interaction under the support of this technology should be understood.

6. Conclusion

This paper investigates seeking the optimal balance for effective utilization of computer-mediated communication technology in network-based foreign language teaching. The research work has significance for improving foreign language teaching effect and presents novelty. Also, this paper discusses the synchronous and asynchronous network foreign language teaching based on the CMC technology from the cognitive perspective. Since synchronous network communication creates a learning environment by promoting interaction and emphasizing the construction and negotiation of text meaning, and it is conducive to the development of students' deep cognitive function. Meanwhile, to meet the needs of students at a specific time and in a specific context, teachers need to seek a method that considers both the technical characteristics and the interactive effect in classroom teaching practice to achieve an optimal balance in all aspects of language education, thus obtaining satisfactory teaching results ultimately.

7. Limitations and Future Research

This paper investigates seeking the optimal balance for effective utilization of computer-mediated communication

technology in network-based foreign language teaching. The research work has significance for improving foreign language teaching effect and presents novelty. The results of this study justified its research objectives. However, there are some limitations in terms of its data acquisition method and research condition as the author only introduced the CMC in foreign language learning from its time characteristics, comparing the language generation under synchronous and asynchronous. Therefore, future research should employ empirical research on the efficiency of CMC in foreign language learning and explore relevant strategies for improving learning adaptability so as to put forward specific and practical suggestions to improve the teaching methods when applying CMC in foreign language teaching.

Data Availability

No data were used to support this study.

Conflicts of Interest

The author declares no conflicts of interest.

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