The Effects of Mobile-Assisted Collaborative Language Learning on EFL Students' Interpreting Competence and Motivation

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ABSTRACT

As globalization continues to grow, there is an increasing need for skilled interpreters. However, the interpreting skills of many students are still deficient: firstly, they are incapable of understanding the source language clearly; secondly, they are incapable of expressing standard English accurately. Therefore, the purpose of this study is to investigate how mobile-assisted collaborative language learning (MACLL) can help English as a foreign language (EFL) students improve their interpreting competence and motivation. The study used a quantitative methodology and involved a sample of 60 students from one university. Their performance was monitored over a semester. To facilitate MACLL, mobile technologies such as Chaoxing App, iFlytek Input, and Praat were used as teaching tools. The results showed that MACLL had a positive effect on the improvement of students' interpreting competence, as evidenced by their improvement in academic performance and acquisition of language knowledge. The research also showed that students' learning motivation was enhanced in the MACLL environment.

KEYWORDS

EFL Students, Interpreting Competence, Learning Motivation, Mobile-Assisted Collaborative Language Learning

1. INTRODUCTION

Research on mobile learning and collaborative learning has expanded with the rapid development of mobile technologies. With the development of globalization, more skilled interpreters are needed. The cultivation of this kind of competence is a task that is incumbent upon colleges and universities. Moreover, the reform of college English teaching has entered an important stage in China (Yang et al., 2017), but the lack of interpreting skills (one of the basic skills of English learners) is still a weakness of many students. As for the training of professional interpreters in the new era, traditional classrooms are limited by teaching time and the single teaching model, which tends to neglect the dominant role

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of students in learning. As a result, students' interpreting competence is further restricted, as well as the effectiveness of the training (Sugarman & Lazarín, 2020).

Some researchers believe that information technology can be helpful in solving these problems (Pan & Gan, 2020; Kohnke, 2020; Wang et al., 2022). In modern education, the application of information technology and tools has become increasingly common, among which mobile-assisted language learning (MALL) has been widely used in teaching and learning practice, which is a model of an effective combination of modern technology and language learning. As a model for learning English as a foreign language (EFL), MALL is considered a promising model for teaching a language in the mobile technology environment (Kukulska-Hulme & Shield, 2008; Palalas, 2015; Zou et al., 2018). Some researchers in the MALL field have found evidence to support its positive effects on learning outcomes (Rueckert et al., 2020).

However, there are still some problems in learning English in such a technological environment: first, with many notifications from different applications on modern mobile devices, it is difficult for students to focus on language learning tasks. As a result, students may suffer from learning distractions (Criollo et al., 2021); second, learning in the technological environment leads to social isolation. Unlike traditional classroom learning, technology often requires students to work independently, which may lead to a lack of interaction and collaboration with peers (Abbasi et al., 2020); third, most students can achieve high scores on paper tests but have inadequate speaking skills in English (Ratnasari, 2020). The learning outcomes of students are adversely affected by these problems.

Based on the literature review, the researcher notes that certain studies have explored strategies such as collaborative learning (CL), which can serve as a potential solution to address the problems. In collaborative learning, learners work together to achieve a common goal (Unal & Gurol, 2019), which means that each member must work hard on their own tasks and integrate their efforts to achieve team success. Shared goals and a sense of responsibility will avoid distractions (Ho et al., 2022). In addition, through CL, students collaborate with others to complete learning tasks, solve problems, and share knowledge and experience, which addresses isolation (Kaynak et al., 2023). Finally, CL provides opportunities for communication and creates a language environment for students to practise oral English through group activities. In the process, partners can quickly spot each other's problems and correct mistakes in time (Lai et al., 2019).

Therefore, this research combines MALL with CL and produces the model of mobile-assisted collaborative language learning (MACLL), which is applied to improve the teaching and learning of interpreting. The population is English as a foreign language (EFL) students in colleges. The teaching and learning activities under the MACLL model are expected to improve students' interpreting competence and motivation, which is in line with the educational goal of training professional interpreters in the new era.

2. LITERATURE REVIEW

This study uses the MACLL model, which includes mobile learning, MALL, and collaborative learning. It is guided by social constructivism and uses ADDIE instructional design for course design. This section reviews previous research and identifies gaps in the research.

2.1 Mobile Learning

Mobile learning is also referred to as 'M-learning' or 'learning with handheld devices' (Hockly, 2013). The concept of M-learning was first proposed by the computer scientist Alan Kay in 1977. According to Hlodan (2010), mobile learning is a type of learning that can take place anytime and anywhere using mobile devices such as laptops, pads, and smartphones. The learning environment is mobile, as are teachers and students. M-learning is the evolution of digital learning. M-learning is seen as a future learning model or an essential learning model for future learning (Parsons, 2016).

In 2000, M-learning first appeared in China. Two papers attracted people's attention to M-learning. One was *A Preliminary Study on Mobile Distance Education*, published in a magazine, *Open Education Research*, and the other was a paper translated by Professor Ding Xingfu, *From Distance Learning to E-learning to Mobile Learning*. After that, M-learning research was preliminarily established. In 2006, the research of M-learning stepped into the commercial promotion stage (Liu et al., 2010). After 2010, various kinds of English learning apps sprang up, involving vocabulary learning apps, listening learning apps, reading learning apps, oral English learning apps and so on. In 2020, the global outbreak of the COVID-19 epidemic made online learning popular. Since then, research on mobile technology, especially on the combination of M-learning and specific subject teaching, has been conducted increasingly.

2.2 Mobile-Assisted Language Learning

The concept of MALL is not universal, although its definitions have evolved over many years. Simply put, MALL is the learning of a second/foreign language using mobile devices such as smartphones, tablets, MP3/MP4 players, personal digital assistants (PDAs), and palmtop computers (Alexander, 2004; Wagner, 2005; Kukulska-Hulme & Traxler, 2005). MALL can be considered as an extension of computer-assisted language learning (CALL) (Chang et al., 2018) and M-learning. As shown in Figure 1, MALL is an emerging field that is a combination of language teaching and research, mobile learning (M-learning), and language learning (Liu, et al., 2016).

In recent years, researchers have studied MALL from a variety of perspectives. In 2021, Kukulska-Hulme focused on the research questions, offered some reflections on the complexity of the broader field of MALL, and suggested some research directions for the future. Previous researchers rarely highlighted research questions, but Kukulska-Hulme's research filled this gap. Meanwhile, MALL has been increasingly integrated with specific language learning practices. English as a universal language has long been a concern. Therefore, research on combining MALL and English learning has made some progress. In addition, practice needs theory to guide it, so researchers have also focused on the theory of MALL. For example, Stockwell (2022) introduced the theory, research, and practice of MALL in his book *Mobile-Assisted Language Learning Concepts, Contexts and Challenges*.

Although research on MALL has gone further and deeper, its problems are gradually being uncovered by some researchers. For example, MALL leads to distraction, isolation, and poor speaking skills. With many tempting apps and notifications, it can be difficult for learners to focus on language learning tasks (Criollo et al., 2021; Li et al., 2021). What's more, one of the limitations of e-learning is social isolation (Abbasi et al., 2020), which may lead to a lack of interaction and collaboration with

Figure 1. An emerging field evolving from the study area of language teaching research, mobile learning, and language learning (Liu et al., 2016)
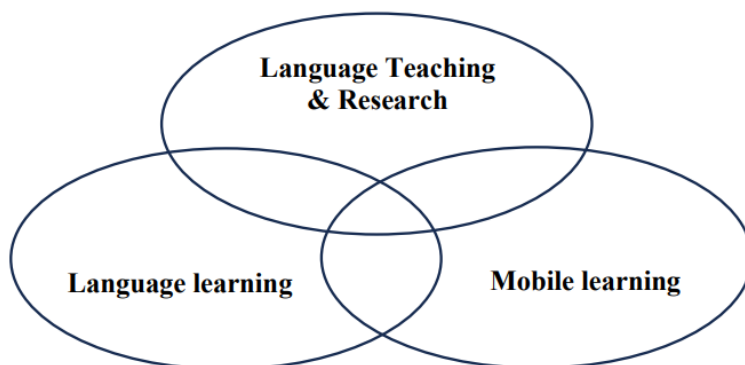
peers. Most students are able to achieve high marks on paper, but do not have sufficient skills in speaking English (Ratnasari, 2020). Some research shows that CL can help to address the shortcomings of MALL (Gharehblagh & Nasri, 2020; Al-Ahdal & Alharbi, 2021; Each & Suppasetseree, 2021; Rachman et al., 2022; Karakaya & Bozkurt, 2022). Therefore, this research attempts to combine MALL with CL.

2.3 Collaborative Learning

Collaborative learning (CL) is a teaching approach that involves groups of students working together to solve a problem, complete a task, or create a product (MacGregor, 1990). Each learner has his or her own responsibility, but the work will only be successful if everyone learns and performs his or her own part properly. According to Kirschner (2001), the characteristics of collaborative learning are:

- Learning is active.
- The teacher is usually more a facilitator than a ''sage on the stage''.
- Teaching and learning are shared experiences.
- Students participate in small group activities.
- Students must take responsibility for learning.
- Students are stimulated to reflect on their own assumptions and thought processes.
- Social and team skills are developed through the give-and-take of consensus-building.

CL is an approach employed by instructors to facilitate learning and for improving learners' performance (Qureshi et al., 2023). Through defending their positions, reframing ideas, listening to other viewpoints, and articulating their points, learners will gain a more complete understanding as a group than they could as individuals (Hernández-Sellés et al., 2019). In addition, collaborative learning is a student-centered approach where the teacher gives more opportunities to students to learn by their own experience as well as in groups to help them grow through collaboration not competition. The teacher, on the other hand, becomes the facilitator or guardian ready to assist them at any time (Each & Suppasetseree, 2021). What's more, with the development of technology, mobile-based collaborative learning is becoming increasingly popular (Peramunugamage et al., 2023). That is the reason why this research adopts CL as a supplement to MALL.

2.4 Social Constructivism

Vygotsky (1978) proposed social constructivism which means cognitive growth initially occurs on a social level and then it can occur within the individual. Meanwhile, it proposes a way to stimulate knowledge. This theory emphasizes social relationships, interactions, and contexts. It means the importance of culture and context in understanding what occurs in society and constructing knowledge (Derry, 1999; McMahon, 1997). Social constructivists contend that the process of sharing individual viewpoints, called collaborative elaboration, results in learners constructing understanding together (Kumi-Yeboah et al., 2017). Collaborative learning is rooted in social constructivism theory and draws upon the notion that knowledge is not solely transmitted from a teacher or a textbook, but rather emerges through collaborative activities, discussions, and interactions among learners (Lam, 2015).

Constructivism theory is rich in content, but its core can be summarized in one sentence: it is student-centered and emphasizes students' active exploration and discovery of knowledge and construction of the meaning of knowledge.

2.5 ADDIE

ADDIE is a model of instructional systems design (ISD) that evolved from post-World War II research in the U.S. military to find a more effective and manageable way to create training programs (Swanson & Holton, 2001). Later, the ADDIE model had a great impact on higher education and enterprises (Clark, 1995). ADDIE (seen in Figure 2) consists of five phases: analysis, design, development, implementation, and evaluation.

Figure 2. ADDIE model proposed by Florida State University in 1975
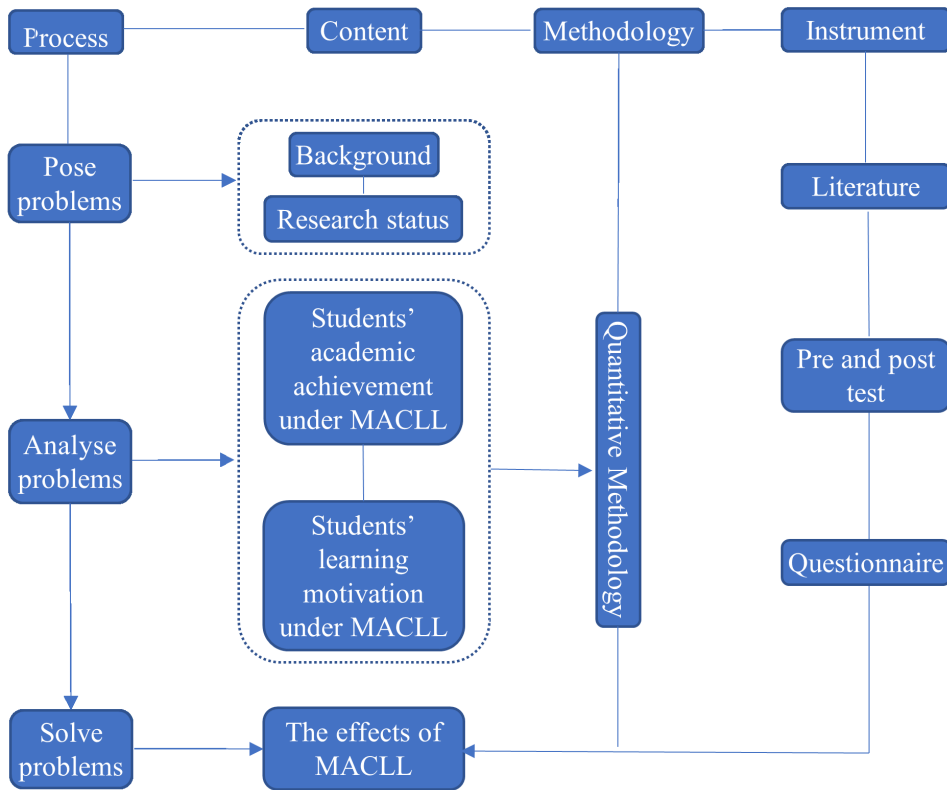
Wiphasith et al. (2016) proposed the principles and processes in the contents design of an e-learning tool for an English subject by using the ADDIE model. Lee et al. (2017) advised that detailed steps of certain ADDIE model phases could be used in a flipped classroom. Lee (2021) analyzed the effects of collaborative flipped learning on science achievement and motivation in high school students. In this research, the design of MACLL necessitates guidance from ADDIE, as its five phases align harmoniously with the specific demands of college-level English courses.

The ADDIE model is adopted in this study because its characteristics and advantages are suitable for the design of interpreting courses, so it can enhance the overall quality and effectiveness of the instructional design. First, the first stage of the ADDIE model is demand analysis, namely, detailed assessment and analysis of the target learners, learning objectives, learning content, and existing resources. Such an approach ensures that education and training programs truly meet the needs of learners and the learning objectives. Second, flexibility. Although the ADDIE model is an orderly five-phase process, it is flexible, allowing for adaptation and customization to the needs of a course. In addition, it emphasizes evaluation and feedback on the effectiveness of education and training programs. Through evaluation, the strengths and weaknesses of the course can be discovered, and the plan can be improved and optimized in the future.

2.6 Interpreting Skills

Interpreting is a process of preparing, performing, and packaging some work related to language when transforming one language to another. Performing includes such parts as listening, memory, note-taking, production, and coping (Liu, 2012). Interpreting skills refer to the skills of preparing,

listening, memory, note-taking production, coping, and packaging. In order to improve EFL students' interpreting skills, the above skills should be cultivated.

Interpreting skills (one of the basic skills of English learners) are still the weakness of many students: In interpreter training for science and technology, traditional classes have a limited number of teaching hours and only one way of teaching. This often means that students' important role in the study is not given enough attention. Additionally, students cannot fully understand and use interpretation skills, and the combined training does not work very well. (Sugarman & Lazarín, 2020).

The MACLL model is expected to tackle these existing problems based on its advantages: breaking the limitation of time and space so that students can get learning resources anytime and anywhere; offering a collaborative learning platform for peer support; providing speech synthesis technology to visualize interpretation products; promoting teacher-student, student-student interaction and building a student-centered learning approach.

In this study, MACLL absorbs the advantages of mobile learning, MALL, and collaborative learning to guide interpreting teaching and learning for achieving the desired learning outcomes. Based on them, the following research questions are proposed:

1. What are the effects of MACLL on students' academic achievements in interpreting courses?
2. What are the effects of MACLL on students' learning motivation in interpreting courses?

3. MATERIAL AND METHOD

This research design follows the approach of posing, analyzing, and solving problems. To achieve research objectives, quantitative methodology runs throughout this study. The research routine is shown in the following Flow Chart 1 (figure 3). In the phase of posing problems, background and research status are introduced based on previous literature. In the phase of analyzing problems, two research questions, students' academic achievement under MACLL, and students' learning motivation under MACLL, are to be explored under quantitative methodology. The pre- and post-tests, as well as the questionnaire, serve as research instruments. In the phase of solving problems, the effects of MACLL are expected to be revealed.

Figure 3. Flow chart One: Research routine

3.1 Instructional Design Under MACLL

ADDIE is an instructional systems design (ISD) model used to support the design of interpreting courses under MACLL, the research procedure is shown in Table 1. The aim of its application is to make the course design in this study more effective and manageable.

In the analysis phase, researchers analyze students' learning features, select mobile learning devices and tools/apps, choose the population and sample, and analyze models/principles for collaborative learning and mobile learning. As learners are college students, they all have their own smartphones, and they all have enough digital literacy to attend interpreting courses online and in classrooms. Under educational modernization, there has been a gradual integration of educational technology into everyday teaching and learning practices. The instructional tools/apps used in this research are Chaoxing App, iFlytek Input, and Praat.

- Chaoxing App is an online learning platform, a kind of learning management system, where teaching materials are uploaded and collaborative learning activities are conducted.
- iFlytek Input is a software that converts speech into text and automatically translates it into the target language. Students can therefore use it to check their interpreting texts for errors.
- Praat is a professional phonetics software that is mainly used to analyze, label, process, and synthesize digital speech signals, and generates various speech graphs and text reports at the same time, so learners can correct their pronunciation visually.

Table 1. Research procedure

Phase 1 Analysis
1. Analyze research problems 2. Select mobile learning devices and tools/apps 3. Choose the population and sample
Phase 2 Design and Development
1. Design pre- and post-tests 2. Select the questionnaire 3. Design and develop a teaching schedule 4. Set up mobile-assisted collaborative language learning (MACLL) environment
Phase 3 Implementation and Evaluation
Collect real data
Week Data Collection Schedule **Treatment Group Control Group** 1 Pre-test Pre-test 2 Students download learning apps and register accounts; Lecture 1 Lecture 1 3 Students are divided into 10 groups with four members each; Lecture 2 Lecture 2 4 MACLL Task 1 Task 1 (traditional learning) 5 MACLL Task 2 Task 2 (traditional learning) 6 MACLL Task 3 Task 3 (traditional learning) 7 MACLL Task 4 Task 4 (traditional learning) 8 Review and summary Review and summary 9 Post-test Post-test 10 Feedback; Questionnaire Feedback 1. Analyze data 2. Write the report

The next step is to choose a sample for this research. After that, students are divided into two groups: the treatment group and the control group. There are 30 students in each class. The treatment group received an intervention, while the control group did not. The treatment group and the control group learn under different environments. For the treatment group, the whole learning activity proceeds under the MACLL model, while for the control group, the whole learning activity follows the traditional learning model.

In the design and development phase, researchers design pre- and post-tests, select the questionnaire, design and develop a teaching schedule, and set up a mobile-assisted collaborative language learning (MACLL) environment. As for the teaching schedule, these lessons are held once a week for 10 weeks, including pre-test, app download, group division, two lectures, four tasks, review and summary, post-test, feedback, and questionnaire (only for the treatment group). In the training parts, four interpreting training tasks on different topics are arranged.

For the treatment group, this study sets up the teaching model under MACLL and combines it with the characteristics of the interpreting tasks. The teaching and learning process of this course includes three parts: pre-class previewing, in-class collaborative learning and post-class reflective learning. The specific learning model is shown in Table 2.

Students in the control group learn in the traditional model (shown in Table 3). The whole process includes three parts: pre-class previewing; in-class teacher-centred learning; post-class reflective learning.

As for pre-class previewing, in the treatment group, instructors upload PowerPoint slides, videos, glossary lists, and related materials according to the course syllabus and learners' needs before each class. Four or five students in each group log in to download the teaching materials on the Chaoxing App and then discuss with their peers and teachers online so as to complete the previewing tasks. Based on the students' online discussion records and completion of the tasks, the instructors understand the students' learning situation and adjust the teaching content to make the teaching more effective. In the control group, students can preview what they will learn in class based on textbooks and handouts. They do not need to engage in learning activities by using mobile technology.

As for in-class learning, the treatment group employs collaborative learning. The instructor gives lessons with the help of software like Chaoxing App, iFlytek Input, and Praat. Each group of four students performs the interpreting tasks in class. Their voice of interpreting production is converted

Table 2. Interpreting teaching and learning under MACLL

Process	Task	Mobile technology	Mode
Pre-class previewing	Preview	Chaoxing App	Online
In-class collaborative learning	Perform Interact Evaluate	Chaoxing App, iFlytek Input, Praat	Offline
Post-class reflective learning	Reflect	Chaoxing App	Online

Table 3. Interpreting teaching and learning in the traditional learning model

Process	Task	Mobile technology	Mode
Pre-class previewing	Preview	no	Offline
In-class teacher-centered learning	lecture listen take notes	no	Offline
Post-class reflective learning	Do homework	no	Offline

into texts by using iFlytek Input, which is displayed on the classroom screen in real time. Through speech recognition, Praat generates a graph of the students' pronunciation, and the students can check their pronunciation against the graph. After one group finishes their performance, they first make self-evaluation and correction, and then other groups evaluate and score their performance by using the Chaoxing App. Instructors view and comment on the analysis reports of students' interactions by logging into the back-end platform. In the meanwhile, the control group employs teacher-centered learning: the teacher dominates the whole class, and they directly tell students what they should know about. What students do is to listen and take notes. There is less interaction in class. If there is any interaction, it is between the teacher and the students. There is no collaborative learning in the control group.

As for post-class reflective learning, in the treatment group, the instructor releases tests on the Chaoxing App to check students' learning in class in order to find their weaknesses and give them timely feedback. In addition, the instructor guides students to communicate and share their learning experiences online by referring to others' learning reflections. Students improve their learning outcomes based on teacher comments, peer evaluations and self-reflection. The instructor collects students' learning reflection forms to create electronic files that serve as a reference for process evaluation. At the same time, in the treatment group, the instructor assigns some homework to students in order to help them strengthen what they have learned in class. Students are required to complete their homework on time and hand it in during the next class.

Furthermore, in the design and development phase, researchers also concretize the teaching materials. First, the 10-week learning materials (seen in Figure 4) are uploaded to the learning platform, Chaoxing App, and the contents are designed into three sections according to the three strategies of metacognition, planning, and monitoring and evaluation (Flavell, 1979). The first section needs to be completed by students before class. According to the planning strategy, teachers upload learning objectives, a to-do list, course resources, and a learning reflection table on the learning platform, from which students can get a brief idea of the lesson. The second section is completed in class, including an explanation of interpreting theories and skills, discussion, and relevant exercises. The monitoring strategy runs throughout. The instructor can monitor students' learning progress by using the learning platform. What's more, iFlytek Input and Praat are applied in the treatment group. In the lead-in part, the teacher guides students to know the background knowledge of this lesson through videos and introduces the content of this lesson through discussion. In the theory part, the teacher provides scaffolding for students and guides them to explore interpreting skills through collaborative learning. In the training part, students work in groups to simulate interpreting. iFlytek Input is used

Figure 4. Learning materials on the Choaxing platform

to convert speech into text and Praat to generate graphs. Other students also have to comment on their performance using the Chaoxing App. The third section is completed after class. Under the guidance of the evaluation strategy, the teacher arranges 10 simple concepts and vocabulary to be tested in order to promote the students' learning situation. Students fill in the learning reflection forms according to the requirements and upload them to the learning platform so as to share the learning products with their peers.

The implementation and evaluation phases of the ADDIE follow the following methodology.

3.2 Quantitative Study

3.2.1 Participants

The research sample included two classes of junior students majoring in Teaching Chinese to Speakers of Other Languages from a college. They had only one English course this semester, which was interpreting. So the research results would not be influenced by other English courses. The number of students in each class was 30. There were six males and 54 females in total. The proficiency of students was at the same level because in the final English test last semester, the average score of Class A was 80.68 and Class B was 81.03. The experimental period lasted for one semester where Class A was the treatment group under the MACLL model, while Class B was the control class under the traditional teaching model.

3.2.2 Research Instruments

3.2.2.1 Pre-Test and Post-Test

A pre-test and a post-test were administered to measure students' academic performance before and after using MACLL. The contents of the pre-test and post-test were the same so that they could be used to measure whether the MACLL model had effects on student's academic performance or not. The pre- and post-tests had three items, interpreting skills, interpreting vocabulary, and interpreting paragraphs, which were completed by students through recording their voices. Items were related to the course content, but avoided the same examples taught in class and/or listed in the handouts. In order to be consistent, the form, the time allowed (30 minutes), the total score (100), and the level of difficulty of the post-test were arranged with reference to the pre-test and verified by two other teachers of the course.

3.2.2.2 Questionnaire

The questionnaire was developed by the researcher to investigate students' learning motivation under the MACLL model. This questionnaire consisted of three parts. The first part (Q1 and Q2) was the overall evaluation of MACLL's influence on students' learning motivation. The second part (from Q3 to Q10) analyzed whether students had learning motivation by investigating their classroom performance in the MACLL environment. The third part (from Q11 to Q15) was about MACLL's influence on future study, career, and development. The questionnaire used a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The five-point Likert scale was interpreted according to the criterion below (adapted from Banditvilai, 2016):

4.51 to 5.00 = Strongly agree
3.51 to 4.50 = Agree
2.51 to 3.50 = Unsure
1.51 to 2.50 = Disagree
1.00 to 1.50 = Strongly disagree

3.2.3 Data Collection

The results of the pre- and post-tests were collected to explore students' academic achievements. The pre-test was carried out in the first week. The post-test was conducted in the ninth week. Scores

on these tests were given by the instructor of the course. The researchers recorded the scores of the treatment group and the control group.

The questionnaires served as the data for exploring students' motivation in interpreting courses in the MACLL model. In the last week, thirty students in the treatment group participated in the questionnaire survey. This survey was conducted online, and 30 questionnaires were distributed, and 30 valid questionnaires were collected.

3.2.4 Data Analysis

Several statistical techniques were used to analyze the data. First, the students' pre-test and post-test scores were calculated in Excel. These data were calculated separately for the academic performance of the treatment and control groups. The researchers sorted the statistical data and calculated the highest score, the lowest score, and the average score, and then drew tables to present them clearly in Excel. Second, descriptive statistics such as mean (M), standard deviation (SD), and p-value were calculated in The Statistical Package for the Social Science (SPSS) to describe the central tendency and variability of the data.

In addition, SPSS was also used to analyze statistics from questionnaires to identify the effects of MACLL on improving EFL students' learning motivation. Students' learning motivation influenced by the use of MACLL was analyzed in terms of mean scores and standard deviations on a five-point Likert scale.

4. RESULT AND DISCUSSION

4.1 MACLL Effects on Students Interpreting Achievements

As shown in Figure 5, in the pre-test, the scores of Class A and Class B were generally at the same level. According to the previous performance of Class A and Class B, the participants had a similar level of English proficiency. The result of the pre-test proved it again. In class A, two students scored below 60, five students scored 60-70, 14 students scored 70-80, six students scored 80-90, and three students scored 90-100. In Class B, one student scored below 60, seven students scored 60-70, 13 students scored 70-80, six students scored 80-90, and three students scored 90-100. In general, almost

Figure 5. The Pre-test scores of class A and class B
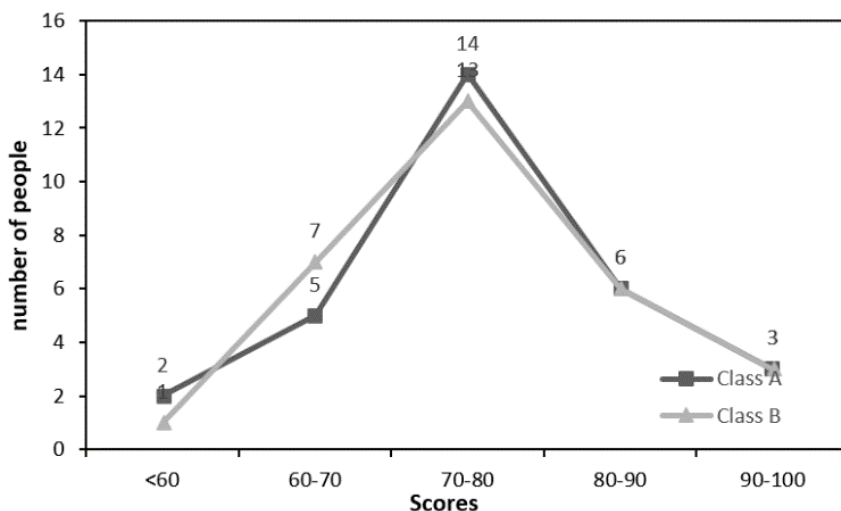
half of the students scored 70-80. It can be seen that students had a certain basis for interpreting, but their competence was limited. Therefore, the setting of learning materials and tasks must be challenging to help students improve their skills.

As shown in Figure 6, in the post-test, the number of students in Class A (the treatment group) who scored above 80 was more than that in Class B (the control group). Compared with the scores of the pre-test, that of the post-test increased. No student scored below 60 no matter whether they were in Class A or Class B. Almost 30% of them scored 80-90 which was five times the number of students in the pre-test. The levels of the two classes were similar before the experiment, which showed that the students in Class A improved their performance under this model and this model could cultivate more excellent interpreting learners. In class A, no student scored below 60, two students scored 60-70, eight students scored 70-80, 13 students scored 80-90, and seven students scored 90-100. In Class B, no student scored below 60, three students scored 60-70, 14 students scored 70-80, 10 students scored 80-90, and three students scored 90-100.

As shown in Table 4, the result of the analysis showed that the treatment group (Class A) had a higher mean of post-test score than the control group (Class B). The mean of pre-test score of Class A was 75.93; the mean of post-test score of Class A was 83.27. The mean of the post-test score was higher than that of the pre-test. The mean of the pre-test score of Class B was 75.83; the mean of the post-test score of Class B was 76.77. The post-test mean was just slightly higher than the pre-test mean. The pre-test and post-test scores of the control group only increased by about one point, which could be assumed that there was no remarkable difference in their academic achievement during the study period.

In addition, an independent sample t-test was also used to compare two pre-tests between the treatment group and control group as well as two post-tests between the two groups. As shown in Table 4, the treatment group and the control group did not show significant differences in pre-test scores ($p > 0.05$), which meant that the performance of the two groups in pre-test scores was consistent. However, the two groups showed distinctiveness in post-test scores ($p < 0.05$), which meant that different groups had different performances on post-test scores. According to the specific analysis:

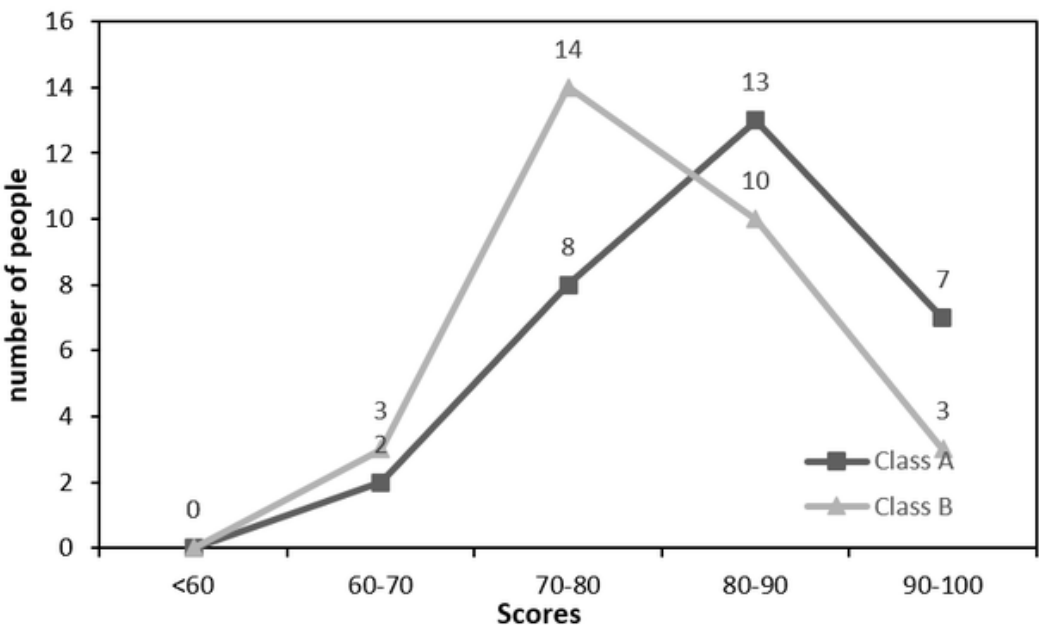Figure 6. The post-test scores of class A and class B

Table 4. Mean of pre- and post-scores

Item	class		Total	p
	A	B		
pre-test score	75.93	75.83	75.88	0.969*
post-test score	83.27	76.77	80.02	0.003**

* $p<0.05$ ** $p<0.01$

the P-value of post-test scores was 0.003 ($p<0.01$) and the specific comparison showed that the mean score of Class A (83.27), the treatment group, was higher than that of Class B (76.77), the control group. This indicated that the MACLL model had a positive effect on the academic achievement of the students in the treatment group.

4.2 MACLL Effects on Students' Learning Motivation

The result shows that MACLL improves students' learning motivation in interpreting courses. The details are discussed below. The questionnaire was applied to investigate whether MACLL is helpful for students' learning motivation. Table 5 reveals the investigation result.

Table 5. Students' learning motivation under MACLL

No.	Items	Mean	SD	Interpretation
1	MACLL evokes enjoyment and satisfaction during the learning process.	3.67	0.88	Agree
2	Compared with traditional learning, it is more effective to learn under MACLL.	3.59	0.85	Agree
3	The instructor can supervise me under MACLL, which urges me to finish my tasks on time.	3.57	0.93	Agree
4	Timely feedback from the instructor can motivate my learning.	3.65	0.92	Agree
5	My learning achievements can be recorded under MACLL, which motivates me to learn more.	3.61	0.81	Agree
6	MACLL can help me truly engage in collaborative learning.	3.61	0.81	Agree
7	I enjoy having discussions by using mobile devices.	3.65	0.83	Agree
8	MACLL can help me dare to share my opinions in class.	3.55	0.86	Agree
9	The higher scores I get in class, the harder I work.	3.63	0.82	Agree
10	When I know others get higher scores than me, I will study harder.	3.51	0.86	Agree
11	I think that learning under MACLL would be beneficial for my learning outcomes.	3.61	0.86	Agree
12	I think that using MACLL would be useful for my future academic development.	3.61	0.99	Agree
13	I think that learning under MACLL would be useful for my future career development.	3.65	1.01	Agree
14	I think that learning under MACLL would be useful for my personal growth and development.	3.59	1.05	Agree
15	I will recommend MACLL to other students who want to enhance their learning motivation.	3.73	0.91	Agree
Total		3.61	0.89	Positive

Table 5 revealed that all students agreed with all items (15 items) in the questionnaire with total mean scores of M=3.61 and S.D=0.89. It was indicated that the students had positive opinions toward the use of MACLL in promoting learning motivation. The mean scores of the students' opinions toward the effect of MACLL on learning motivation could be categorized as the highest one (M=3.67, SD=0.88) and the lowest (M=3.51, SD=0.86).

By observing the data in the first part of the questionnaire, the following conclusions could be drawn: First, 65.1% of the students believed that MACLL made them experience enjoyment and satisfaction in learning. In other words, MACLL increased their interest in learning. Increased interest in learning was one of the manifestations of increased motivation to learn. Second, 61% of the students believed that it was more effective to learn under MACLL compared to traditional learning. That is, MACLL was effective in the promotion of their learning. Their motivation to learn was stronger when they experienced a sense of achievement in learning.

By observing the data in the second part of the questionnaire, the following conclusions could be drawn: First, the instructor's behavior had an impact on the student's motivation to learn. Supervising and giving timely feedback would help to motivate students to learn. 74.8% of the students agreed that the instructor's supervision could motivate them to complete their assignments, and only 6% of the students disagreed, while the rest of the students took a neutral position. 71.4% of students agreed that timely feedback from instructors could motivate their learning. Instructor's feedback could make students aware of their own problems in time so that they could correct them immediately. Second, scores could improve students' motivation to learn. The research found that students cared about the scores they received. When they were rewarded with scores during the course, they were more motivated. If they knew that they were lagging behind their peers, they were more likely to work harder. Third, peer interaction increased under MACLL, which was also one of the manifestations of increased learning motivation.

Through observing the data in the third part of the questionnaire, conclusions can be drawn as follows: Overall, students believed that MACLL played a positive role in their future studies, work, and personal development. These factors also motivated them to learn. However, the standard deviations (SD) of Q12, Q13, and Q14 were around and even greater than 1, indicating that students had different opinions about whether MACLL would have a potential impact. 48.9% of the students agreed that MACLL would have a potential impact. 40.8% of the students were neutral, indicating that they were unsure of the potential value of MACLL, which meant that the impact of technology on future development was not being taught and experienced in the classroom.

According to the results of the questionnaire survey, the researchers found that the students in Class A found MACLL interesting and creative, which made them more focused in class, so they absorbed more knowledge. By collaborating with their peers, they were more self-disciplined and could complete their work on time. This was an indication that MACLL really enhanced the students' learning motivation. However, most students were not clear about the impact of MACLL on their future development, and they only focused on the current courses. This meant that instructors needed to explore in depth how MACLL could be applied to courses and discover its potential value in supporting students' future development.

The researcher reviewed many previous studies, but the effects of MACLL on students' interpreting competence and motivation could not be found. This was probably due to the lack of published research on this topic. In this respect, the findings of the present study were not consistent with any previous research studies. On the other hand, if the focus is on the individual characteristics (MALL, CL, interpretive competence, and motivation), the results of the present study are in line with previous studies. For example, a study conducted by Al-Ahdal and Alharbi (2021) showed that the use of mobile devices for collaboration helped learners with better vocabulary retention. Another study exploring learner motivation through the use of a mobile application also claimed that students were highly motivated (Kohnke, 2020). What's more, a study conducted by Each and Suppasetseree

(2021) showed that students improved their listening comprehension after learning with mobile blended collaborative learning (MBCL). Consequently, the combination of the four (MALL, CL, interpreting competence, and motivation) also had positive effects on students' interpreting competence and motivation, as mentioned in the findings of the present study.

The application of MACLL in the interpreting course is an empirical study of combining education with technology. It is an attempt to improve the quality of interpreting teaching and learning. On one hand, MACLL supports flexible and autonomous learning, for it is not limited by time and space (Each & Suppasetseree, 2021) and has great potential in interpretation teaching. It can effectively help students overcome anxiety and depression in the process of language learning, so as to improve students' interpreting competence. On the other hand, it is necessary to apply MACLL to interpreting teaching and learning. There are two reasons behind this. The first reason is the objective requirements of the information age: with the rapid development of mobile technology and the opening up of society, and the requirement of cultivating English language learners, it is the mission of educators to cultivate professional English language users by improving students' comprehensive English literacy and English interpreting competence. Therefore, it is imperative to advance the reform of English interpreting teaching in colleges and universities. The second reason is the realistic requirements of optimizing English interpreting courses. The application of mobile technology in English interpreting courses can improve traditional teaching methods. In recent years, mobile technology has promoted the innovative development of English interpreting teaching and cultivated students' oral English communication and expression abilities indirectly (Ding, 2021). With the help of mobile technology, college English interpreting teaching can combine the advantages of mobile technology to enrich students' learning materials and provide a new model for language learning.

This study has made important contributions to language teaching and learning. First, it offers some references to creating more technology-driven classrooms because collaborative learning makes learning more efficient in a technology environment. Furthermore, it provides some inspiration for teachers to create more ways of integrating education and technology to suit learner preferences (Al-Ahdal & Alharbi, 2021). Finally, both educators and learners need to be knowledgeable in technology, make full use of the advantages brought by technology, cope with the challenges brought by technology, and make technology empower education.

5. CONCLUSION

This study constructed a MACLL model by deeply integrating educational technology with English interpreting in the context of globalization and informatization. The research showed that this model had some effects on improving students' academic achievements in interpreting competence: more language knowledge and more interpreting skills were acquired. The research also proved that students' learning motivation was promoted by MACLL. Most students hold a positive attitude towards the MACLL model used in their interpreting learning. In general, this new model "MACLL" is likely to be an effective teaching method for the new educational setting. However, although MACLL solves some problems in current learning, its potential benefits and future influence of it are still ignored. Most students cannot find the positive effects of MACLL on their future learning, career, and personal development, which is the limitation of this research and needs to be focused on future study.

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CONFLICT OF INTEREST

The authors of this publication declare there is no conflict of interest.

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