

Mobile Learning Activities for Students' English Learning Engagement in China

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Abstract

Although mobile-assisted language learning (MALL) activities have the potential to foster student engagement, few studies have investigated the influence of such activities on undergraduate students' engagement in College English learning in China, particularly in a newly developed, post-pandemic hybrid learning environment. This study adopted a mixed methods design to examine the influence of mobile learning on student engagement and explored students' lived experiences of using MALL activities for English learning. For the study's quantitative data collection, 206 students completed an online questionnaire that included questions regarding motivation and active learning strategies. Ten students participated in the photo-production visual method and semi-structured personal interviews. Findings show that MALL activities enabled a unique opportunity to enhance students' active engagement and knowledge construction by multiple ways of information sharing and language practices. Easy access and effective ways of communicating on learning apps intrinsically motivated students to participate in language learning. Through mobile learning platforms, students were scaffolded by their instructor or more knowledgeable peers in a more instant, visual, specific, and affective manner. Collaboration among students was not exemplified among undergraduate learners and the challenge of self-regulation in using cellphones was uncovered. These findings are significant for educators and decision-makers to lessen the stereotype of cellphones for learning and recognize the benefits of making use of personal devices for catering to individual learners' needs, fostering connections, elevating engagement, and increasing English skills. A new MALL model is put forward.

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I started my endeavour to engage university students' English learning with mobile assistance when I undertook an instructor's position in 2016. From then until now, I ultimately gained a vast amount of knowledge about effective use of mobile devices for learner engagement and completed this dissertation. So many people are to be acknowledged and thanked for accompanying me along the journey of learning, exploring, and investigating.

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CHAPTER ONE: INTRODUCTION TO THE STUDY

Since the 1980s, researchers have investigated mobile-assisted learning via telephones to support learners at a distance (Hashim et al., 2017). In the following decades, mobile devices have been explored for their potential to support language learning. During the first decade of the 21st century, diverse studies on mobile learning involved devices such as computers, cellphones, personal digital assistants (PDA), and MP3 players for language learning. It was not until Kukulska-Hulme and Shield (2008) put forward the definition of mobile-assisted language learning (MALL) that mobile devices for language learning were investigated extensively. They refer to MALL as a technology-supported learning approach mediated via devices available anytime and anywhere, formally, or informally, with the features of portability, spontaneity, and interaction.

Despite the investigation of mobile devices' affordance and accessibility, their implementation as teaching or learning tools in postsecondary classrooms in China is still under development (Zhang & Guo, 2015). Built upon a social constructivist perspective, this dissertation is an investigation of students' engagement when mobile learning activities are adopted in College English classes in a university in China. Existing literature shows the potential of mobile activities for enhancing student engagement while uncovering gaps on MALL and engagement in the context of College English learning in China. I adopt a mixed methods design that includes a descriptive quantitative survey and a photo-production visual method with interviews, to explore students' engagement.

Background and Rationale

According to its National Bureau of Statistics, China has more than 28 million postsecondary enrolments in higher education, representing one of the world's largest higher

education systems (Huang, 2019). The Ministry of Education and the Higher Education Department in China highlight the necessity of obtaining English as a Foreign Language (EFL) skills in postsecondary education. In China, College English, an integral part of higher education, is a compulsory course for all first- and second-year non-English major undergraduate students (Ministry of Education, 2007). Students take College English for 3 to 4 hours each week, 17 weeks each semester, during the first 2 years of study. In principle, students who complete the first 2 years of College English courses take the College English Test 4 (CET-4). In the third year, students who have passed CET-4 take College English Test 6 (CET-6; Zheng & Cheng, 2008). CET-4 for non-English major students is a requirement of graduation from universities, while CET-6 is optional (Liu & Zhang, 2013; Zhang & Guo, 2015).

Despite the significance and requirement of learning EFL for higher education students, a lack of motivational engagement in the learning process has been reported as an issue (Li et al., 2016; Zhang et al., 2015; Zhou, 2012). Foreign language learners, such as College English students in China, have less access to actual language communication and acquisition and rely more on language learning with teachers' explicit instruction (Krashen, 1985). Zhou (2012) indicates that college students' passivity is generally found in the whole process of English learning in China. Zhang and Guo (2015) argue that since College English is a course for undergraduate students of various majors, students found the course content not relevant to their field of study. Thus, their engagement in this course is based on an instrumental and specific motivation—to pass CET-4 or CET-6. Li et al. (2016) found that students in College English classes were not interested or motivated in this course mainly due to three reasons: students experienced a lack of success while learning English; their interest in this course was not strong; and they felt incompetent in the coursework, such as readings, assignments, and class activities.

Similarly, Zhang et al. (2015) argue that undergraduate students in China did not know what to engage with as they entered universities and experienced a lack of student-staff interaction. It has been found that undergraduate students are not satisfied with the traditional teaching methods, such as chalk-and-talk-only and PowerPoint-only presentations, used all the time in English classes (Peng, 2015; Rao, 1996). Li (2014) found that due to the lack of contemporary theories, such as constructivism, College English classes were still under a teacher-centered, instructional approach for passive learning. Students' dissatisfaction drives instructors and researchers to take a close look at engagement and seek innovative solutions to improve students' motivational engagement in classrooms (Wang & Cui, 2016). Therefore, College English teachers must use strategies to motivate and engage students in learning.

Since 2016, I have been working as an English instructor at a university in China. Given that College English was delivered in a lecture hall with more than 100 students, I found that traditional learning activities could never engage all students in a limited lecture time. During one and a half hours of lecture, only several students could have the chance to interact with the instructor while the rest of the students kept silent. Students had rare opportunities to practise the language, not to mention receive feedback from the instructor. Caught in a vicious cycle, despite the importance of English learning, students lost interest and felt unmotivated in this course since they found rare opportunities of engaging in learning activities. In this context, I noticed that cellphones, possessed by all students, may be used to make up for the deficient information sharing between students and their instructor. Without a formal learning platform running on students' and my ends, I made use of quick response (QR) codes for students to scan and access learning activities. Conventional printed hand-out activities usually took time to distribute materials to students, collect answers, and mark papers, while this digital support helped me

quickly obtain students' responses to questions. With a passion for motivating students in language learning more efficiently, I embarked on this study of using mobile learning activities to enhance learner engagement.

In 2019, the English instructors in a university in North China started using a mobile application—Rain Classroom, a platform for content delivery and activity implementation—in College English classes. This app has excellent potentials for College English instructors to benefit from information and communication technologies, which can act as a motivator and enhancer for students' engagement (Zhang & Guo, 2015). This teaching approach is consistent with the expectations for English instructors to use communicative activities and multimedia approaches to achieve teaching goals flexibly and to engage students (Li, 2016; Peng, 2015). Mobile devices can activate the potentials of collaborative in-class activities that engage students in learning a foreign language because of the feature of interaction and communication (e.g., Ahn & Lee, 2016; Nguyen et al., 2015). In the spring of 2020, under the special circumstance of the COVID-19 pandemic that caused lockdown in some areas of China, this university was among the ones that transferred classes to online systems. Rain Classroom was one of the online systems instructors used for the delivery of instructions. Since fall 2020, university students have returned to campus for face-to-face (F2F) learning, at which time some instructors continued using Rain Classroom to implement learning activities with enhanced knowledge about online teaching approaches. Therefore, based on the status quo of EFL in China and the situation in this university, this study explored Chinese higher education students' experiences of engagement in EFL in the hybrid learning environment, using mobile applications (apps), including Rain Classroom and other self-directed learning apps, as learning tools in F2F classes.

Research Purpose and Questions

In China's College English education, MALL is still under development, and studies on it are rare (Wang & Cui, 2016). The existing studies about MALL in other countries could not contribute much to English development in China because of the unique characteristics of College English courses in China (e.g., large size, compulsory requirement, teacher-centered learning, quiet and passive learners, compulsory English exams for graduation, learning English as a foreign language instead of a second language). Despite the existing research on students' engagement of MALL, there is little research examining the influence of MALL on Chinese undergraduate-level students' engagement, including their motivation and active learning strategies of learning College English or through the lens of social constructivism. This dissertation investigates undergraduate students' engagement when they use mobile apps as a learning tool in College English classes in a university in China. The present study uses a descriptive survey and visual data collection and interviews for the breadth and depth of students' motivational and behavioural aspects of engagement. The research questions are:

1. To what degree are Chinese college students engaged in learning English as a foreign language, with the support of a mobile-learning platform?
2. What are undergraduate university students' lived experiences of engagement when they use mobile learning activities for English learning?

Theoretical Frameworks

This study is rooted in a social constructivist perspective (Vygotsky, 1978) that explains phenomena and any relationships within them to MALL. From the assumption of social constructivism, engagement is achieved through an interactive relationship with the surrounding environment. This study is also built upon a model of collaborative learning (Kukulska-Hulme &

Shield, 2008; Kukulska-Hulme & Viberg, 2018; Warschauer, 1997), which is derived from social constructivism. Engagement theory by Kearsley and Shneiderman (1998) further explains the rationale of using technology to enhance engagement. The following section briefly describes these key terms.

Social Constructivism

Vygotsky (1978) highlighted the interactive relationship among human beings by indicating that interaction and communication among students or between students and a teacher can build up experiences and knowledge, thus contributing to language learning. Vygotsky also suggested that teachers provide scaffolds to learners who otherwise may not achieve a higher level of expertise themselves.

Collaborative Learning

Collaborative learning (Kukulska-Hulme & Shield, 2008; Kukulska-Hulme & Viberg, 2018; Warschauer, 1997) explains the significance of finding information, sharing ideas, and working together for task completion. The development of Web 2.0 supports multiple ways of information and learning materials exchanges. The instructor can provide scaffolding to learners via the mediation of online platforms (Tang & Hew, 2017; Viberg & Grönlund, 2013).

Engagement Theory

Engagement theory (Kearsley & Shneiderman, 1998) is focused on technologies' role in achieving student engagement that otherwise may be difficult to realize. Technologies provide platforms for collaboration and interaction. Instructors play the role of facilitators, monitors, and participants and are responsible for knowledge exchange and reflection.

Description of Pilot and Reflection

In March 2020, I implemented a study piloting the instruments that I use in this dissertation project, namely a survey (Likert scale) and a qualitative visual method (photo-production + interview). Given the exceptional circumstances of the COVID-19 pandemic, I conducted this study to investigate students' online learning status in College English emergency remote learning classes in a university in China. One hundred and one participants responded to the survey questions, and five participants participated in the photo-production visual section followed by individual interviews. I tried out the mixed methods design for the final dissertation and confirmed the advantages of the combination of numerical data from the survey, participant-generated photographs, and oral communications in the interviews. Those data, generated from the quantitative and qualitative methods, contributed to an understanding of student engagement in breadth and depth. Besides, this pilot study granted me the opportunity to learn the process of applying for ethical approval, recruiting participants, collecting data, analyzing data, and presenting results.

Based on the pilot study results, I adjusted the scales in the survey that I used for this dissertation. For instance, I did not include the scale of extrinsic motivation from the original survey in the pilot survey. Yet, the participants frequently referred to their engagement in College English classes as coming from an external goal orientation, leading me to the decision to include this scale in the final dissertation and to make comparisons between the numerical results of their extrinsic and intrinsic motivation. This pilot study also uncovered the drawbacks of my photo-production method. For example, students took screenshots of class scenarios, resulting in similar photographs. In the dissertation project, I provided more training to the participants by displaying various types of pictures that they could take and encouraging them to

record the moments they previewed and reviewed using mobile devices. I also increased the number of participants from five in the pilot study to 10 in the dissertation to ensure data saturation and a comprehensive, in-depth understanding.

Methodology

I employed a convergent mixed methods design (Check & Schutt, 2012; Creswell, 2012; Creswell & Clark, 2018) with a quantitative descriptive approach (Berends, 2006; Creswell, 2012) combined with a qualitative visual method (Guillemin & Drew, 2010; Pink, 2013). This particular mixed method provides a more complete understanding of a problem alongside in-depth descriptive details that would be difficult to achieve using either of the approaches alone (Creswell & Clark, 2018). Scales can measure mobile learning's influence and produce numerical data that indicate the frequency and trends of students' learning status of a large group or population. The characteristics of the target population can also be described, including gender, age, and major. The results from the quantitative phase may be applied to similar College English learning contexts. The subsequent visual method qualitative phase provides non-linguistic data, thus extending and elaborating details that result in a rich and comprehensive picture (Reavey, 2021) of students' in-the-moment learning experiences. The qualitative approaches also give explanations of students' answers in the quantitative survey. Thus, the results from the quantitative and qualitative data complement each other.

Outline of the Remainder of the Dissertation

This chapter provided a brief introduction to the design of the dissertation. In Chapter 2, I concentrate on specifying theories that underpin the frame of the dissertation and review the existing literature about MALL and engagement. Chapter 3 introduces the methodology I used, including a quantitative descriptive design and a qualitative visual method with online

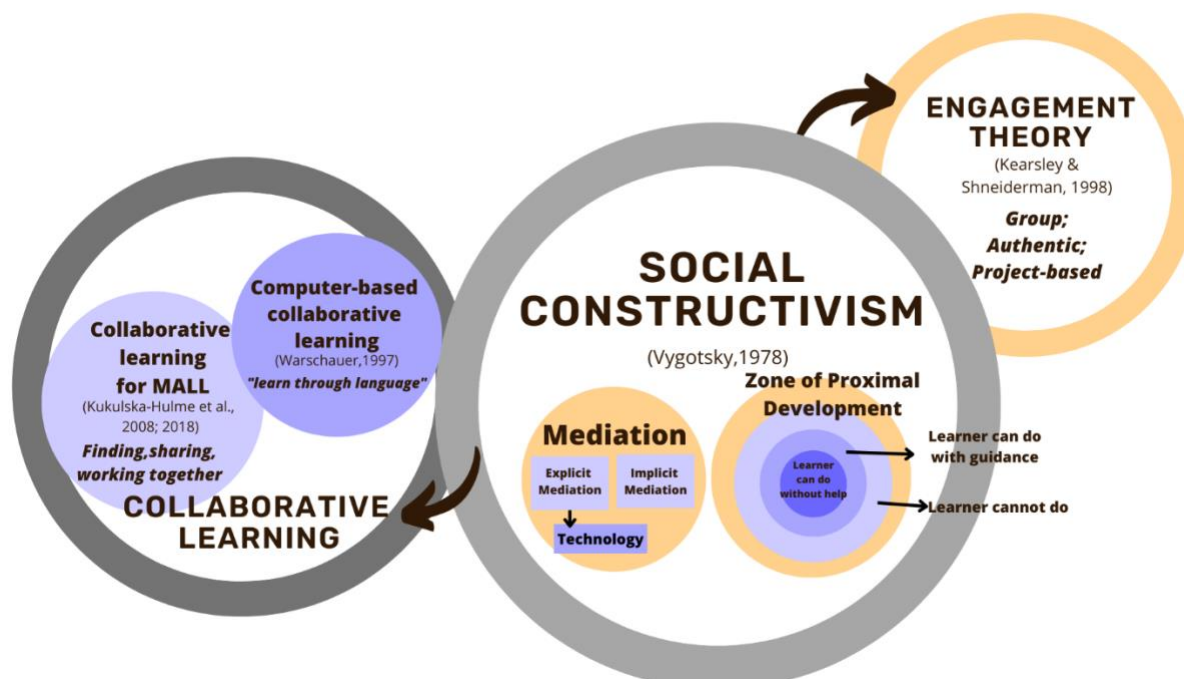
questionnaires, photographs, and interviews as data collection approaches. Chapter 4 presents the research findings from the convergent mixed methods design with the analysis of results from questionnaires, findings from questionnaires and interviews, and findings from photographs and interviews to answer the study's two research questions. Chapter 5 presents a discussion of findings followed by the implications for theory, implications and recommendations for practice, strengths and limitations of the study, future research, and a conclusion of the dissertation.

CHAPTER TWO: THEORETICAL FRAMEWORKS AND LITERATURE REVIEW

In this chapter, I describe the frameworks that construct the theoretical foundations of this study, followed by a review of the literature focusing on adopting mobile activities for language learning (MALL). For the theoretical frameworks, I base this study on the primary theory of social constructivism by Vygotsky (1978), which led to more specific theories guiding the research directions, namely collaborative learning and engagement theory. With regard to the literature review, I discuss the relationships between engagement, academic achievement, and MALL, contributing to the necessity of the current study on mobile learning activities for student engagement. In the end, I analyze the postsecondary learning, mobile learning situations in China, and the integration of Western theories into Eastern learning contexts.

Theoretical Frameworks

Neither digital platforms nor technological innovations are the core determining elements for language education; rather, it is students' interaction with activities and materials provided by digital devices that matters (Collier, 2018; Collier & Perry, 2020). This study is situated in the theory of social constructivism (Vygotsky, 1978), collaborative learning (Kukulska-Hulme & Shield, 2008; Kukulska-Hulme & Viberg, 2018; Warschauer, 1997), and engagement theory (Kearsley & Shneiderman, 1998). Social constructivism emphasizes interactive relationships among human beings; collaborative learning highlights sharing information and collaboration for task completion; and engagement theory explains the usefulness of technology in classes. This section introduces the connection of those theories with the research purpose of the current study. Figure 1 depicts an overview of the frameworks.

Figure 1*Overview of Frameworks*

Social constructivism (Vygotsky, 1978) is a guiding framework for this dissertation, with the concept of mediation and the zone of proximal development introduced to explain how technology mediates students' cognitive development. Collaborative learning, derived from social constructivism, consists of the theory of computer-based collaborative learning (Warschauer, 1997) and collaborative learning for MALL (Kukulska-Hulme & Shield, 2008; Kukulska-Hulme & Viberg, 2018), highlighting the necessity of integrating collaborative work into language learning. In the end, engagement theory (Kearsley & Shneiderman, 1998) provides a rationale for how technology contributes to student engagement.

Social Constructivism

Vygotsky believes that the learning process is highly intertwined with the social and cultural interactions with others, with which learners co-construct knowledge. This notion of co-construction highlights the contributions of society and the surrounding culture to individuals'

cognitive development; in other words, human learning largely depends on a social process, which is the interaction with other people. Thus, the ways people interact and the culture they live in fundamentally influence their knowledge construction and personal development. He indicated that cultural development stems from social and individual hierarchies:

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals. (Vygotsky, 1978, p. 57)

Learning appears on the social and individual levels, respectively, showing the influence of social and interpersonal activities on individuals' development. Vygotsky's ideas illustrate the significance of constructing student–teacher and student–student relationships in facilitating learning. These relationships can be achieved through student interactions and collaboration with peers and teachers. From a constructive perspective, instead of passively receiving and processing information, students actively build knowledge via interactions with the environment (Anthony, 1996; Hiebert & Carpenter, 2006; Jonassen, 1991).

A key component of Vygotsky's (1978) social constructivism is mediation, which means that cultural signs, tools, and symbols can mediate knowledge development. Wertsch (2017) further explains that mediation builds a link between social and historical processes and individuals' mental processes; human mental functioning is social-historically situated. In this concept, speech functions as a means of mediating individuals' participation in social interaction and communication. Building on Vygotsky's notion of mediation, Wertsch separated the modes of mediation into explicit mediation and implicit mediation. Explicit mediation refers to either

explicit stimulus means that are introduced by an individual or the materiality of the stimulus means that carry obvious and non-transitory trends. Thus, an explicit mediation can be a set of artificial stimuli overtly introduced to an activity and direct the object of activities. On the contrary, rather than being externally or intentionally introduced, an implicit mediation is automatically and unintentionally built and involves “signs in the form of natural language” (Wertsch, 2017, p. 65). From this perspective, an implicit mediation can be an ongoing communicative stream with the primary function of communication.

According to this social constructivist stand, tools mediate knowledge construction through interaction with other people. Technologies that carry information and are introduced by instructors are regarded as a type of tool functioning as an explicit mediation to direct the object of learning activities. Some experts have made an identical argument that technologies can play the role of building human relationships, contributing to interpersonal communication, and facilitating knowledge construction (Tang & Hew, 2017; Viberg & Grönlund, 2013). Technologies that are connected to the internet are the base of building a community of inquiry where student–student, student–teacher, student–content, teacher–content, content–content, and teacher–teacher interactions are constructed (Anderson, 2011). With the mediation of technologies in the learning community, teachers implement cooperative activities, encourage dialogue among students, guide learning objectives, and potentially engage community members to accomplish academic goals (M. Huang, 2021).

Another concept, the zone of proximal development developed by Vygotsky, explains how learners acquire knowledge through social interactions. The zone of proximal development is defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving

under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). With guidance or assistance from either more knowledgeable teachers or peers, learners can achieve a wider range of knowledge, leading to future independent problem solving (Wertsch, 2008).

Researchers have demonstrated that Vygotsky’s theory of social constructivism of interaction and communication can build up experience and knowledge (Hilao & Wichadee, 2017). Zhou and Brown (2015) also assert that Vygotsky’s theory is widely applied in computer-based learning because of the interactive and responding interface. With a social constructivist perspective, students are expected to construct knowledge themselves in a well-designed project and be more engaged in the course (Li & Guo, 2015).

Collaborative Learning

This study is also built upon the model of collaborative learning (Kukulska-Hulme & Shield, 2008; Kukulska-Hulme & Viberg, 2018; Warschauer, 1997), which originates from social constructivism (Ilic, 2015). Warschauer’s (1997) computer-mediated collaborative language learning outlined unique features of technology support, which not only can be applied to computer-based learning but also fits MALL. Kukulska-Hulme and her colleagues put forward the significance of collaborative learning for MALL. The following section discusses those frameworks.

Situated in the context of language learning, Warschauer (1997) built upon the framework of social interaction and developed the theory of computer-mediated collaborative language learning. From his view, conversational interactions among language learners facilitate language input and output and eventually learners’ linguistic competency, thus explaining how learners learn *through* language in a speech community or social group. In this way, social interaction creates “an environment to learn language, learn about language, and learn through

language” (Warschauer, 1997, p. 3). The advantages of employing technology for building social interaction is the mediation of text as a new form of communication. Distinguished from paper-based dialogues that are typically slow in exchanging ideas, internet-based text communication can be easily transmitted, stored, edited, and rewritten without boundaries of users’ locations.

Though Warschauer’s (1997) collaborative language learning is designed for computer-mediated learning, the features he put forward can still be regarded as guidelines for designing and assessing effective mobile-assisted activities as follows:

- text-based interaction;
- many-to-many communication;
- time and place independent communication;
- long-distance exchanges;
- hypermedia information and student publishing;
- situated learning.

As mentioned earlier, text-based interaction is a unique feature of technology-supported communication so that it can be applied to not only computers but also mobile devices.

Synchronous many-to-many communication is another distinguishing feature of technology-mediated learning through which members of a learning community express ideas, compare views, and make reflections. The mobility of digital devices, including mobile devices (McCarty et al., 2017), determines that learners can be time and place independent for communication and long-distance information exchanges. Collaboration thus can be realized among learners from any location that has internet services. Hypermedia that carries current authentic information (e.g., transport schedules, cultural information, news) are great resources for learners to discover, share, and collaboratively make use of to construct new knowledge together. The authenticity of

learning resources obtained from mobile devices has been well established in MALL studies (e.g., Liu & Chu, 2010). Finally, computer-mediated learning serves situated learning, allowing learners to experience authentic communication and interaction while connecting to humans and resources outside the classroom. These features are notably beneficial for College English classes, which usually consist of a large number of students. With those features integrated into the classroom, simultaneous multiple responses from students will be allowed and individual students' expression of ideas permitted. Likewise, interaction among students encourages diverse perspectives, thus generating rich discussions and ideas and fostering critical skills. Therefore, Warschauer's (1997) collaborative learning frames this research project on MALL.

In their early years of study, Kukulska-Hulme and Shield (2008) claimed that collaborative learning in the existing literature on MALL was limited to finding and sharing information through mobile devices for building up knowledge due to the limited features of mobile devices at the early stage. When first appearing in classrooms, smart phones, as a representative of advanced mobile technology, were used primarily between the teacher and students for instructional content delivery and not encouraged for student–student interaction. Thus, though mobile devices may carry the function of connecting to the internet, they also are limited to one-way communication. In more recent studies, with participatory features of Web 2.0 loaded on mobile devices, internet users can generate content that can not only be shared with other users but also modified by others. This development enables collaboration among learners through mobile devices. Therefore, after reviewing more recent literature, Kukulska-Hulme and Viberg (2018) added that collaborative learning through MALL is a learning approach of working together for task completion during which communication occurs. The design of collaborative learning enables interdependent learning through which learners depend

on one another to accomplish a task. Kukulska-Hulme and Viberg put forward five elements that can be integrated into designing collaborative learning:

- learner agency and self-direction under the guidance of a teacher;
- learners' construction of knowledge;
- authentic communication and the integration of language skills;
- problem-solving and game-playing as popular approaches in task design;
- a desire to facilitate learning in and across multiple contexts and beyond the classroom.

Engaging in collaborative learning, learners practise language skills and accumulate language acquisition. Since the in-class activities included in this study require social cooperation between peers and interaction between learners and the teacher, those activities enable learning opportunities such as peers exchanging ideas and learners obtaining feedback from their instructor. The focus on collaboration, communication, and interaction aligns with Web 2.0 technologies, which involve participatory characteristics, such as interaction, networking, and collaboration, instead of merely retrieving information (Wang & Vasquez, 2012).

Engagement Theory

Kearsley and Shneiderman's (1998) engagement theory is another theory that provides a fundamental framework specifically for technology-based teaching and learning. This theory refers to involving students in learning activities in which they interact with others using technology and the theory explains the major advantages of adopting MALL in English classes. Kearsley and Shneiderman pointed out the significance of engagement using technologies: students can be engaged in classes without technology, but "technology can facilitate engagement in ways which are difficult to achieve otherwise" (p. 20). The principle of this

theory is integrating technology to create an authentic learning environment where students are actively engaged in cognitive processes such as creating, problem-solving, evaluating, and decision-making. The components of creating a technology-supported learning environment are as follows:

- occurs in a group context (i.e., collaborative teams);
- are project-based;
- have an outside (authentic) focus (Kearsley & Shneiderman, 1998, p. 1).

The principle and the components of this theory are in harmony with social constructivism and collaborative theory for the emphasis on naturizing students' social skills in authentic language environments where students can present opinions, share ideas, have dialogues, and make decisions (Hazari et al., 2019). The first component reflects the necessity of grouping students for collaboration. The second component addresses students working together on a project that may involve researching a question, reporting results, and evaluating answers. Finally, the third component is significant to motivate and satisfy students because of the practical usage of skills and knowledge learned in course activities.

For a large number of students in a class, technology allows for the information-exchange opportunities by individual students, so that students are engaged in the class by inputting resources and outputting personal thoughts. In order to foster technology-based engagement, the instructor's role goes beyond monitoring and facilitating the interactions; instructors are also participants in the activities for knowledge exchange and reflection (Beldarrain, 2006; Knowlton, 2000; Tam, 2000). These suggestions are parallel with the idea of the zone of proximal development that focuses on the teacher's role as a facilitator. As such, instructors are expected to construct engaging learning conditions to support students' meaningful interaction with peers and instructors and contribute to students' active learning and motivation.

Literature Review

Full use of modern information technology is encouraged according to the guideline of constructing an interactive and collaborative learning platform (Ministry of Education, 2007), thus cultivating students' English communication abilities. This section discusses the literature on the definitions of engagement, the correlation between engagement and academic achievement, the development of MALL, the relationship between MALL and engagement, and the gap in existing studies on mobile activities. This literature review demonstrates the facilitating influence of MALL on language learning engagement which, nevertheless, has not been fully explored in the postsecondary College English learning context in China.

Engagement

Engagement is a multidimensional construct. It has various definitions and applications, such as engagement in schoolwork, academic engagement, school engagement, student engagement, and student engagement in academic work (Appleton et al., 2008). Researchers define engagement by combining various aspects and considerations. To be more specific, Libbey (2004) takes engagement as a representative of the relationship between students and schools, and defines engagement from a motivational, behavioral perspective. Engagement in this sense is students' motivated learning and good performance in school, measured by two indicators: "self-regulated learning and disruptive behaviour" (Libbey, 2004, p. 276), namely students' awareness of learning and their disturbing behaviours in classrooms, respectively. Focusing on the relationships within engagement as well, Yazzie-Mintz (2006) argued that engagement in the school context is about students' relationship with the school community, including the people, the structures, the curriculum, the pedagogy, and so forth. Some researchers define student engagement in academic work from a psychological perspective by

arguing that it is a process of making psychological investment and effort to learning (Marks, 2000; Newmann et al., 1992). Libbey (2004) regards engagement as closely related to school connectedness and concludes that nine constructs support students' connection to school: academic engagement, belonging, disciplines and fairness, likes school, student voice, extracurricular activities, peer relations, safety, and teacher support. In other research, such as in the studies by the National Research Council (2003) and Martin (2008), engagement and motivation are synonyms and used interchangeably throughout the investigation.

The definition of engagement can also be segmented into several subtypes. For instance, the definition of engagement in schoolwork by the National Research Council/Institute of Medicine (2003) emphasizes behaviour and emotions, mediated by perceptions of competence and control, values and goals, and social connectedness, allowing students to gain knowledge and belonging. Another one of the most influential definitions is given by Fredricks et al. (2004), who indicated that school engagement is being actively committed, involved, or occupied. They further categorized engagement into three aspects: behavioural engagement, emotional engagement, and cognitive engagement. Behavioural engagement, a crucial indicator of academic outcomes, accounts for participation in academic activities. Emotional engagement refers to students' reactions to teachers, peers, and the learning environment, either positively or negatively. Lastly, cognitive engagement is students' willingness to make investment and effort in learning.

Despite the diverse definitions and categories of engagement, this study is along the line of Barkley's (2009) definition of engagement because of it targets postsecondary students. Situating in a college class, Barkley (2009) interviewed college instructors and came to the definition that engagement is "a process and a product that is experienced on a continuum and

results from the synergistic interaction between motivation and active learning” (p. 8). With this definition, students who are actively motivated to seek information and understanding during class learning are regarded as engaged learners. This definition also aligns with social constructivism since Vygotsky (1978) argued that learners needed to be engaged with social and cultural interactions in the learning process. Thus, learning occurs through the engagement of social learning activities (Matthews et al., 2011).

Motivation and active learning are inseparable in relation to achieving engagement. More specifically, motivation involves students’ expectations of performing tasks successfully and the belief of learning value. Active learning means that students’ minds are actively engaged, such as self-questioning, analyzing, and incorporating new knowledge to the schema. It would be meaningless to have enthusiastic and motivated students if it did not lead to learning. Conversely, active-learning students with reluctance and resentment for learning would not be engaged. Thus, motivation and active learning are regarded as the two elements of necessity that work together synergistically and interactively for increasing student engagement. In order to actively engage students in postsecondary learning, cooperative or collaborative learning and problem- or project-based learning are the most commonly employed approach (Barkley, 2009; Tinto, 2012).

This definition of engagement is consistent with many other researchers’ arguments about engagement and affective factors of learning. The elements of motivation and active learning are parallel with the definition by Libbey (2004), who argued both motivation and behaviours as indicators of engagement. The behavioural perspective of engagement is consistent with many researchers’ definitions (Fredricks et al., 2004; National Research Council, 2003; Ryan, 2000). The motivational perspective of engagement is also embedded in other researchers’

arguments. For example, Fredricks et al. (2004) assert that motivation is a type of affective reaction and partial emotional engagement. Wolters et al. (2013) ascertained that motivational belief is a critical factor in understanding students' academic engagement, and students' self-reported motivation can predict their engagement. In all, this study takes motivation and active learning as essential elements of engagement to navigate the review of the literature, data collection, and data analysis.

Engagement and Academic Achievement

Students' engagement shows a positive correlation to academic achievement and is a critical contributor to successful learning in all subject contexts, including English language learning (Barkaoui et al., 2015; Cho & Castañeda, 2019; Fredricks et al., 2004; Northey et al., 2018; Pascarella & Terenzini, 1991; Wolters et al., 2013; Yin & Wang, 2016). Fredricks et al. (2004) highlighted the importance of obtaining the three subtypes of engagement for students' development: behavioural engagement has a direct effect on the academic outcome and prevents school dropping out; emotional engagement ties to students' willingness to work; cognitive engagement goes deeper and indicates one's personal investment in learning. Fostering classroom engagement from all aspects, therefore, is necessary. From a language learning perspective, engagement is critical for developing language skills because it represents the willingness to practise the target language. For instance, Wolters et al. (2013) argue that motivation is a critical factor in determining students' engagement and predicts standardized reading achievement. Northey et al. (2018) found that students' participation in group discussions on a mobile platform is a positive influencer of academic achievement.

Motivation, a significant ingredient of achieving student engagement as Barkley (2009) insisted, has been emphasized in many studies. Dörnyei and Schmidt (2001) argued that

motivation for learning a second language is regarded as a critical factor because it explains the reason for increased performances. With motivation, students are more willing to put effort into learning a second language even if the process is challenging. To address the significance of motivation on learners' learning behaviours, Krashen (1982, 1985) indicated that motivation, as a vital affective factor, predicts learners' L2 proficiency. Specifically, integrative motivation, the desire to join a community that speaks the target language, directly affects students' actual behaviours in the classroom, such as volunteering to answer questions more often. Instrumental motivation, the desire to achieve language proficiency for practical reasons, such as tests and jobs, can encourage students' interaction with others. Similarly, Ortega (2014) also put forward the importance of integrative motivation and instrumental motivation, nurturing more successful L2 learning. In a reciprocal relationship, L2 learning success can boost motivational learning behaviour to a higher level.

Active learning as another aspect of student engagement, meaning "learners are thinking and caring about what they are doing and doing what they are thinking and caring about" (Barkley, 2018, p. 54), is also inseparable when it comes to academic achievement. As argued by some researchers (Bonwell & Eison, 1991), active learning usually is characterized as: (a) students are involved in activities more than listening, (b) more emphasis is placed on developing students' skills instead of transmitting information, (c) higher-order thinking (analysis, synthesis, evaluation) is involved, (d) students are engaged in activities, and (e) students' exploration of attitudes and values is emphasized. Adding to that, engagement is inherent in some teaching approaches, such as problem-based learning and collaborative learning (Barkley, 2018). Active learning is highly connected to academic achievement, as explained by Barkley (2018) from a cognitive psychological perspective. When students' minds are actively

engaged, the schema of facts or ideas could be activated and rebuilt to construct a more complex structure of knowledge and academic achievement. The significance of active learning for academic achievement has been emphasized by many researchers who report a close connection between those two factors. For instance, Martin and Bolliger (2018) indicated that active learning opportunities on an online learning platform provided students with meaningful interactive learning experiences when they participated in collaborative group work, discussions, and other activities, ending in positive learning outcomes. Similarly, Han and Lu (2020) also highlighted the significance of actively engaging in activities for academic results. They argued that active learning manipulates students' attention by requiring them to engage in learning content instead of passive listening. With this student-centered approach, students have more control over their engagement of the class and thus think, question, and build knowledge in an active way.

Given the significance of classroom engagement, researchers propose suggestions for instructors on how to foster engagement effectively. Engagement can be achieved through teaching materials, collaborative opportunities, and teaching techniques, thus enhancing fun activities and fun deliveries (National Research Council, 2003; Tews et al., 2015). McGroarty et al. (2004), for instance, suggested two elements for meaningful learning: "engage the students' attention" and "engage in the course content" (p. 20), which emphasized the importance of engaging and interesting content that enable engagement in learning. The variety of teaching materials and collaborative opportunities is a promoter of engagement and academic achievement (National Research Council, 2003). To exhibit greater engagement and better learning outcomes, Tews et al. (2015) argued the importance of teaching techniques, such as games, role-playing, and collaborative exercises, suggesting fun activities and fun deliveries. The integration of technology and activities has been considered a powerful tool for building an

engaging classroom community (Barkley, 2009; Figg & Jaipal, 2009; Figg & Jamani, 2011).

Instruction that employs technologies has been illustrated as meaningful, relevant, and motivational, positively influencing students' engagement (Figg & Jaipal, 2009).

MALL

Research on mobile-assisted learning started in the 1980s when researchers used telephones to provide distant language learning support (Hashim et al., 2017). In research that followed, particularly since the 2000s, with the emergence of smart devices, including smartphones and tablets, studies investigated mobile devices for language learning. For instance, Cho et al. (2004), based on the idea of computer-assisted language learning (CALL), examined the usefulness of mobile CALL learning for Korean language learners. They discussed using a cyber-pet game, mobile learning courseware, mobile learning systems, and mobile tutoring on PDA and personal computers. Thornton and Houser (2005) explored Japanese university students' use of mobile devices with a particular look at educational activities for English learning via mobile phones. Stockwell (2007) argued the features of mobile learning over CALL: portable, smaller, less expensive, lighter, and more powerful. EFL learners ran an intelligent tutor system on their cellphones or computers to finish vocabulary tasks. Chinnery (2006) was the first researcher who brought up the concept of MALL. She and her colleagues reviewed the existing mobile devices, primarily cellphones, PDAs, and iPods, and discussed mobile technologies' benefits and challenges. Chinnery concluded the features of mobile learning (also called m-learning and mobilelearn in this study) via portable media involved the capacity for language learning that is F2F, distance, or online. However, they did not give a clear definition of MALL or clarify any theoretical foundations that frame MALL.

As a technology-supported learning approach, MALL is defined as language learning that is mediated via devices available anytime and anywhere formally or informally (Kukulkska-

Hulme & Shield, 2008). Though developed from CALL, MALL has distinct features: portability, spontaneity, and interaction. As McCarty et al. (2017) categorized, laptops are not considered MALL devices. Compared with mobile phones through which users can share resources with others any time anywhere, laptops do not carry the flexibility of time and location. From McCarty et al.'s perspective, CALL provides fixed knowledge by delivering materials to learners while MALL is concerned more about learner "autonomy, collaboration and other social-cultural approaches" (p. 21). Yet, dating back to more than a decade ago, Kukulska-Hulme and Shield (2008) noted that most relevant studies about mobile learning were aimed at content delivery, and the affordances of interaction were seldomly considered. They advocated undertaking social contacts and collaboration for learning, which fundamentally influenced the following research in multimedia and co-construction of knowledge. Yedla (2013), for instance, built upon the initial ideas of MALL and argued that quality education should be accessible to everyone and everywhere through the integration of education. They emphasized using mobile technology to share information, receive feedback, and merge games for effective and entertaining knowledge acquisition. As they concluded, MALL involved the following five elements: inventiveness of knowledge acquaintance, mobility of learning setting, interactivity of the learning process, integration of instructional content, and immediate and urgent need of learning.

The types of mobile devices in research, along with the development of technology, have changed dramatically. Mobile devices used to cover various types, including mobile phones, handheld computers, Mp2 players, Mp3 players, digital voice recorders, and multi-function mini-camcorders (Kukulska-Hulme & Shield, 2008). In later studies, such as in Ok and Ratliffe's (2018) research, mobile learning tools also involved emerging technologies, such as iPads, iPods, smartpens, and e-readers. For instance, Al-Bogami and Elyas (2020) explored the integration of an iPad application into EFL classrooms in Saudi Arabia. Three constructs of learners'

perception were integrated, namely helpfulness, ease of use, and engagement. Students presented a positive attitude towards the integration of iPad-based learning activities for its activation of students' different levels of cognitive thinking, such as "memorize, understand, apply, analyze, evaluate, and create" (p. 12). Further, the sense of self-directness, ownership, and the notion of gamification positively influence students' engagement. In another study, Tai et al. (2022) employed virtual reality (VR) players as devices of EFL vocabulary learning, through which learners took part in conversations with virtual characters and demonstrated significantly higher vocabulary learning and retention due to real-time interactivity and feedback through playing.

Despite the diversity of types in existing research, the rapid development of mobile devices, especially of cellphones, led to all-in-one features within one single device. Laptops and smartphones are the two primary devices used by undergraduate students, according to a statistical study by Gürleyik and Akdemir (2018). In Saidouni and Bahloul's (2016) research, 67% of the participants own smartphones and take them as their mobile learning devices. An overwhelming majority (87%) of the students in Calabrich's (2016) study reported owning smartphones for learning. In a recent study about mobile learning, a survey of 300 college students in China showed that every student owned a smartphone, followed by a 95% owning rate of personal computers and 45% of tablets (Zhang & Zuo, 2019).

One primary purpose of adopting MALL in existing research was to examine the impact on language skills, such as vocabulary, speaking, and listening. Among these language skills, vocabulary learning via mobile devices gained the most attention from language learning. Building upon the anywhere and anytime affordance of mobile devices, Saidouni and Bahloul (2016) pointed out that in their survey of a university in Algeria, more than 80% of the participants reported using smartphones for looking up vocabulary and students had a positive attitude toward the usability, effectiveness, and satisfaction of MALL. Bensalem (2018),

grounding his study on the constructivist learning theory, demonstrated that social-networking applications on smartphones could be used as a medium for creating a learner-centered environment where learners use new vocabulary for communication, interaction, and collaboration. This approach improved EFL students' vocabulary learning, due to the flexibility of time and location of mobile devices. In a study by Klimova and Polakova (2020), researchers conducted a questionnaire survey with university students to investigate their perceptions of an EFL vocabulary learning mobile application. Again, students agreed on the helpfulness of the application for test achievement, learning from anywhere and at any time, and obtaining corrective feedback. Similarly, Li and Hafner (2022) compared the English vocabulary knowledge of students from two groups: a mobile learning group, and a paper-based learning group. The findings show that digital and non-digital word cards enhanced learners' vocabulary learning, with more significant gains presented in mobile learning learners because of the functions of native speaker pronunciation and multimodal designs (auditory and visual presentation).

Regarding other skills, Jones et al. (2017) investigated the potential of a mobile app to assist language and cultural learning for immigrants in European countries, with a particular focus on supporting English reading, listening, speaking, and pronunciation. They found that the mobile app in their project supported immigrants to learn vocabulary in everyday contexts, build their confidence, and reduce the anxiety of social networking. In alignment with this finding, another study demonstrated that WhatsApp as an application for communication was beneficial for reducing EFL learners' speaking anxiety and improving language performance, compared with speaking during F2F interviews (Han & Keskin, 2016). In terms of oral communication, in Zhang et al.'s (2019) study, elementary school students in Taiwan also

demonstrated enhanced speaking performance through collaborative learning activities mediated by mobile devices. By using mobile devices, students prepared, made, and conducted drama that combined voices, photos, and texts in authentic contexts. The procedure of collaboratively engaging in drama enabled the opportunity of speaking the target language, motivated learners to participate, and influenced students' learning behaviors and achievement in storytelling, writing abilities, sentence complexity, and diversity. Mobile-assisted collaborative learning is also exemplified in a study by H. Huang (2021). The researcher implemented a 10-week intervention of smartphone-based collaborative video tasks among college students in China. The results of the study indicated significant improvement in speaking abilities, collaboration skills, and learning engagement, demonstrating that smartphone-based video-making is an effective language learning tool due to the ubiquity of technology. Similar positive effects on speaking skills (Ahn & Lee, 2016; Nguyen et al., 2018; Tai et al., 2022) and English reading (Wang & Smith, 2013) have been found.

MALL and Engagement

Mobile devices, coupled with a collaborative learning approach, are mediating tools to provide opportunities for interaction and communication, build up experience and knowledge (Hilao & Wichadee, 2017; Kukulska-Hulme & Shield, 2008; Northey et al., 2018; Rodríguez et al., 2017), and therefore have the potential to spark English learning engagement. Researchers have investigated participants' perceptions of MALL, some of which involved motivational and affective engagement and confirmed mobile devices' contribution. For instance, the use of mobile devices among 7th-grade students in Taiwan created a learner-centered and real-world online learning environment and significantly improved learning performance and motivational engagement (Liu & Chu, 2010). In the context of European higher education, Berns et al. (2016) argued that a game-based app on mobile devices for vocabulary learning improved learners'

motivation because of the advantages of combining individual learning and collaborative learning. Similarly, a recent study on Spanish as a second language reported that mobile devices positively increased motivational engagement and sustained motivation for learning (Cho & Castañeda, 2019). In a more recent study, Al-Bogami and Elyas (2020) adopted iPad apps in a middle school EFL classroom in Saudi Arabia. The research findings from a survey showed that students perceived a positive attitude on the use of iPad for reading and vocabulary learning. The use of iPad activated different levels of cognitive thinking. Moreover, students became more confident to share opinions or voice ideas in the class through submitting answers on the platform anonymously. Those changes have a positive effect on their motivation to learn, enjoyment of participating in the tasks, and engagement in language learning.

One important feature of mobile devices, chat-based communication through instant messages has also been investigated with positive attitudes obtained from learners in higher education. So (2016) examined the acceptance of WhatsApp for accessing learning materials and interacting between the instructor and students. The integration of instant messaging improved the learning achievement of the participants, with positive perception and acceptance of the use of WhatsApp. In another study (Winet, 2016), the researcher discussed how teachers accelerated the learning process and increased students' satisfaction using messaging apps, such as WeChat, WhatsApp, and Facebook. Instant messages carry unique features that are not comparable with conventional learning, including but not limited to writing and responding immediately, helping each other in real-time, and working seamlessly. The researchers strongly suggested that mobile instant messaging be integrated into learning for enhancing students' learning motivation and personalization of classroom experience.

Chat-based communication in EFL classes has been investigated in comparison to computer-mediated learning through Facebook and mobile-mediated learning through

WhatsApp. Andujar and Salaberri-Ramiro (2021) examined Spanish university students' engagement with three scales, behavioral, emotional, and cognitive engagement in a survey. In both types of learning, students' emotional engagement was found at a higher level in terms of students' interest and excitement. However, a significant difference appeared in terms of cognitive engagement between students of these two learning models. Students using computer-based communication were found to be more focused during the interactions on the social medium. Students with mobile communication benefited from the synchronous communication "on the go".

Yet, research results regarding learners' engagement are not always positive. Because of the assumption that mobile devices, particularly cellphones, are mainly used for connections and entertainment, a study in a secondary school in Germany showed that participants did not persist in using mobile devices for self-learning (Ludwig, 2018). Similar results emerged in another study, during which only a small portion of students reported increased interests and motivation by self-directed mobile learning (Aamri & Suleiman, 2011). Students found themselves easily disturbed during mobile learning and could not stay focused (Zhang & Zuo, 2019). In another study, participants showed reluctance to receive instructional materials on mobile devices outside school hours because of the possible interference with their private lives (So, 2016). In a study by Klimova and Polakova (2020), though students agreed on the helpfulness of the application for test achievement, learning from anywhere and at any time, and obtaining corrective feedback, they also reported the communication performance on this application was not as supportive as they expected.

Motivation and engagement were one of the most common issues in previous studies of MALL, but the research on it was not well presented and the methodological rigour was limited

in many of the studies (Chwo et al., 2018). It was evident that the duration of the studies were short or not mentioned, theoretical frameworks were lacking, and the use of mobile devices was not integrated into the curriculum (Chwo et al., 2018; Ok & Ratliffe, 2018; Viberg & Grönlund, 2013; Wang & Cui, 2016). In Chou et al.'s (2017) study, they adopted self-report questionnaires to develop students' learning experiences. However, across the whole article, there were no indicators of questions related to engagement in spite of the research results about elevated learner engagement. Thus, the self-report learning questionnaire and the informal interviews showed students' learning experiences and attitudes but not necessarily engagement. Similarly, in H. Huang's (2021) study, a variety of techniques for collecting data were used, such as a questionnaire to examine students' perceptions of group collaboration, final reflection papers to collect students' thoughts of the vlog projects, interviews for students' opinions of overall learning experiences, and comparisons of speaking pretest and post-test to examine speaking performance. However, the questionnaire was used for students' group collaboration without a focus on engagement. In Freiermuth's (2017) study, it was indicated that open-ended and close-ended questionnaires were implemented after the intervention of smartphones and showcased an increase of intrinsic motivation and learning engagement. Nevertheless, the author did not include any theories or methods used either for the measurement or the analysis of engagement. In another study examining students' performances of using MALL, Huang et al. (2016) omitted the experiment's duration, which means that the retainment of the students' engagement was not fully examined. Those studies, without detailed explicit descriptions, suggest a fruitful direction for future research to develop, share, and refine measurement tools.

In summary, there have been some research studies that investigated students' perceptions of MALL and proposed the potential of contributing to learner engagement.

Participants in most of the studies indicated positive attitudes towards mobile learning and elevated motivational engagement mainly for the reasons of 1) a learner-centered and real-world environment, 2) a combination of individual learning and collaborative learning, 3) activation of different levels of cognitive thinking, and 4) increased confidence in sharing opinions virtually. The feature of chat-based communication through instant messages, in particular, enabled synchronous real-time interaction among learners. However, in most of the studies, mobile learning activities were integrated either as a small portion of formal learning or as an informal learning approach, without full involvement in the EFL curriculum. Students' motivational engagement and active learning in a hybrid learning environment that combines mobile support for the whole formal learning process has rarely been researched. In some other cases, theoretical foundations or rigorous methodological designs were not explicitly described.

Mobile Activities for Postsecondary Learning in China

Some studies investigated the effects of mobile activities on postsecondary students' EFL learning engagement. A decade ago, Wang et al. (2009) researched a blended English class (800 students online and 200 students in a classroom), during which students watched course videos and accomplished writing assignments and quizzes. The students reported enhanced behavioural, intellectual, and emotional engagement, transitioning from passive learners to active learners. Yet, the effects of new technological assistance nowadays cannot be evaluated by simply referring to studies a decade ago given the rapid changes of mobile technologies. In terms of more recent studies, along with mobile technology development, Chen (2015) conducted a survey with 450 college students in Taiwan on their self-directed usage and perception of mobile learning. The results showed that students had an overall high level of perception, acceptance, and engagement with mobile English learning, including the usage of music players, video

players, English learning apps, and dictionaries. However, this study focused on the general use of mobile learning rather than investigating specific mobile learning applications, platforms, or activities for fostering students' engagement.

Some studies examined the usefulness of a specific platform implemented in universities in China; however, either the research designs lacked explicit explanations or student engagement was not investigated as an influencer. For example, given the affordances of interactive communication through text messaging, voice messaging, and group chats on a social medium (WeChat), Guo and Wang (2018) conducted a survey with 110 students in a university in China on their perceptions of WeChat used for College English learning. With regard to the interactive features, such as answering questions, participating in discussions, and sharing lecture content, students presented agreement on the effectiveness and usefulness of this platform. Though the researchers concluded students' enhanced engagement in mobile learning, the survey did not include engagement or cover any indicators of engagement (e.g., motivation, learning strategies), which lacked empirical evidence for supporting this statement. Another study by Yu and Yu (2021), based on a technology acceptance model (perceived usefulness and perceived ease of use as two constructs of using technology), investigated students' usage of Rain Classroom in a university in China using a mixed methods approach (pre-and post-questionnaires and semi-structured interviews). Through comparing a control group and an experimental group, they concluded that the usability of Rain Classroom is significantly higher than that of the traditional learning in terms of eight attributes: effectiveness, efficiency, satisfaction, learnability, memorability, errors, cognitive load, and timeliness. The latter study focused on students as users of a learning platform but did not elaborate on their experiences of learning engagement and classroom participation.

Several studies have investigated students' experiences of using Rain Classroom in universities in China; yet those studies did not target language learners' perceptions. To be specific, in Li and Song's (2018) study, which was built upon the framework of material affordance (technology property and individual perception), affective affordance (mental and emotional states of engagement), and social affordance of technology (social collaboration), the participants (graduate-level students in a university in China) presented higher engagement upon using a mobile platform, Rain Classroom, according to a comparison of pre and post surveys. However, this mobile technology was used for students' engineering learning, which cannot represent its usefulness for an English learning procedure. Another study (Yu & Yu, 2021) has investigated the impact of peer and superior influences on undergraduate students' usage of Rain Classroom in a university in China. The results of the study indicated a high acceptance rate and enjoyment among students, especially for the synchronous interactions between students and instructors and the accessibility of a large amount of learning resources. Peer learning (peer interactions and problem solving) and superior influence (instructor sharing lecture notes, assessing students' assignment, and checking attendance rate) also played an important role in students' acceptance of this web-based learning management system. However, again, this study is an investigation of general use and acceptance of all university students without a specific focus on a language learning perspective and students' experiences. Additionally, how Rain Classroom was used in this university (whether incorporating the three phases of pre-, during, and post learning) was not clarified either.

Incorporating Social Constructivism With Chinese Higher Education

In previous studies, researchers have applied constructivist-based pedagogies into English teaching among Chinese learners. The results illustrate the suitability of those approaches while coming with doubts and challenges of implementing the pedagogies. For instance, Shi (2012)

introduced social constructivism into his class and employed learner-centered teaching approaches that encouraged active participation and autonomous thinking. Through hands-on, minds-on activities that require students' active practice and the use of language skills, students showed higher motivation and were more engaged in English learning. However, Chinese educators are concerned about an underestimation of the foundational knowledge that is believed to be obtained through memorizing, the effectiveness of a student-centered approach, and the incompatibility of constructivism with the exam system in China (Tan, 2017). Researchers also found that Chinese language learners had difficulties with accepting constructivist teaching approaches because of a cultural clash (Chen & Bennett, 2012). Given the contradictory beliefs about social constructivism, it is important to explore the applicability of this theory in Chinese MALL in higher education.

The educational reform from passive learning to active and autonomous learning is a requirement of the Ministry of Higher Education in China (Tan, 2017). It has been evident that students in Asian countries tend to be quiet and passive learners in English language classes (McCarty et al., 2017), which may derive from the lack of daily necessity of using a foreign language, the anxiety of making mistakes, the fear of speaking in public, and so forth. The long-standing teacher-centered teaching approaches have been rooted in Chinese education with rote memorization being the major learning methods. This pedagogy operates on the expectations that memorization and repetition lead to the storage of knowledge and thereby intelligence development. However, for students who want to develop a comparatively higher level of English language skills, rote memorization is insufficient according to Bloom's Taxonomy. Thus, constructivist approaches may be applied to open up to more complex cognitive frameworks, such as those that include actions such as analyze, evaluate, and create, and meet individual and contextualized learning objectives in English language learning.

Paine and Fang (2006) claim that pedagogies can be justified by referring to traditional historical theories and global situations. Western theories should and can be introduced to bring ideas for professional development. The cross-cultural and international opportunity of idea exchanges can connect Chinese educators with contemporary thoughts in the West. Social constructivism generally rejects the idea of passive learning where knowledge is transferred by teachers; instead, it grounds learning in the engagement in the real world (Dewey, 1916) and suggests learners take the lead in knowledge-constructing activities (Tan, 2017). Vygotsky's sociocultural perspective illuminates the role of social interactions in establishing a language learning environment that fosters collaboration either among students or between students and a teacher (Warschauer, 1997). From there, interaction and communication build up experience and knowledge (Hilao & Wichadee, 2017), which are mediated by tools (Tang & Hew, 2017; Viberg & Grönlund, 2013).

The employment of this theory in College English learning also aligns with the pedagogical reform in China that requires a transition from an exam-oriented to a quality-oriented paradigm. The pedagogical reform calls for a “shift from an over-emphasis on passive learning, rote memorization and mechanical training to one that promotes students' active participation, independent inquiry, practical ability, problem-solving skills and teamwork” (Ministry of Education, 2007, p.1). Pedagogical approaches, such as incorporating activity-based learning, inquiry-based learning, and cooperation are suggested to support this transition. Chinese educators have identified constructivism as the dominant theory to carry out the reform and advocated a student-centered and self-directed education to elevate students' knowledge construction abilities (Tan, 2017).

The Influence of COVID-19 Pandemic on the Development of Technology-Based Learning

In the spring of 2020, during the first outbreak of the COVID-19 pandemic in China, the government launched a policy of “suspending classes without stopping learning” (Zhang et al., 2020) to cope with the spread of the virus. In response to this policy, universities in China switched normal F2F classroom learning to emergency remote learning as a temporary alternative for delivering lessons through online learning platforms. Instructors in universities had to handle learning platforms for teaching purposes after receiving a short training on using technologies. As a result, even the instructors who had never taught online courses were encouraged to run commonly used platforms (e.g., Rain Classroom, Tencent Classroom, Tencent Meeting, Xuexitong) for teaching and take advantage of the functions of technologies to deliver rich and high-quality instructional materials and learning sources (Huang et al., 2021).

As a consequence of the driving force of the pandemic, a combination of mobile-assisted learning with F2F learning had been widely accepted by many instructors when universities reopened. With new knowledge of cooperating online learning platforms, instructors are expecting to bring along better solutions to elevate students’ learning motivation and active learning in English education. Thus, students’ engagement in the newly developed hybrid learning model is worth investigating. In a study conducted with sophomores in a university in China, Gong (2021) implemented an intervention of smart learning with Rain Classroom used for online and offline learning during the phases of pre-class, in-class, and post-class learning. Students participating in this study indicated their satisfaction towards using Rain Classroom and their learning motivation was highly improved according to the results. Gong’s study is an important indicator of the usefulness of mobile learning platforms that brought along innovative teaching alternatives for language learning. Yet, it did not explain how students were motivated and whether students were actively engaged in learning activities.

Significance of the Study

Incorporating the Western theory of social constructivism into the Chinese learning context, this dissertation study is an exploration of the influence of mobile activities on student engagement in hybrid F2F classes. Despite the existing literature on the potential effects of mobile-assisted learning on foreign language learning, Chinese undergraduate students' engagement in the hybrid learning environment has not been fully investigated. Given the EFL requirements for university students and the particular educational context in this country (e.g., large-size classes, quiet language learners), MALL has the potential to facilitate interaction and engagement in large-size classes.

This study is positioned to encourage instructors to make use of innovative teaching approaches in EFL classes. Seeking solutions through technology to facilitate engagement will enhance learning outcomes (Oliver, 2006). The use of technology within EFL classes should not be limited to existing functions, platforms, or even mobile devices in the literature. Instructors should make use of whatever resources that are available to them to facilitate class engagement.

Because of the stereotype of mobile devices for entertainment features, the potential of mobile devices in educational settings has not been fully recognized. Despite the capacities of MALL, negative attitudes from instructors towards using mobile devices, particularly cellphones, set barriers in implementing this digital learning (Aamri & Suleiman, 2011). Since some instructors ban cellphones during instructional time, this study adds to knowledge about whether mobile devices are a contributor or a disturbance in classes and may affect university policies about cellphone use.

Learner engagement is critical and complicated in the context of educational practice (Hidi & Renninger, 2006). Engagement is not simply an issue with university students in China but also a global issue in all aspects of educational settings. Findings from this study, therefore,

put forward possible solutions to deal with the big issue of student engagement in classes, which not only benefit language learners in China, but also provide suggestions to language educators and researchers from other areas and in other countries.

Chapter Summary

This chapter illustrated the theoretical foundations of this dissertation from the domain of social constructivism, collaborative learning, and engagement theory to demonstrate the potentials of MALL for College English learning. Then, it provided a comprehensive literature review of the definitions of engagement, the relation between engagement and academic development, the progress of MALL, the connection between MALL and engagement, and the development of mobile activities for postsecondary learning in China. Situating the study in the era of the COVID-19 pandemic, I discussed the influence of this pandemic on the development of technology-supported learning. Finally, I specified the significance of this study in terms of the integration of Western theories into Eastern classrooms, the encouragement for pedagogical innovation, the transition of stereotypes of mobile devices, and a call for highlighting engagement issues. The following chapter introduces the research methodology used for this study—mixed methods that integrate questionnaires, a photo-production visual method, and interviews.

CHAPTER THREE: RESEARCH METHODOLOGY

In this chapter, I first outline the research methodology of a mixed methods design and the rationale for choosing a quantitative descriptive design and a qualitative visual method. I describe the mobile activities currently implemented in the College English classes at a university in China. I then include the details of the research design with the consideration of ethics, the choice of participants, a description of the survey and photo-production visual methods, and the corresponding data collection and analysis procedures.

Mixed Methods Design

This study adopted a convergent mixed methods design (Check & Schutt, 2012; Creswell, 2012; Creswell & Clark, 2018; Harris & Brown, 2010) with a descriptive quantitative method (Berends, 2006; Creswell, 2012) followed by a photo-production visual method and interviews (Guillemin & Drew, 2010; Pink, 2013; Reavey, 2021) to obtain an in-depth understanding and description. The purpose of a mixed methods design is to understand a phenomenon more fully than using either of the methods alone (Gay et al., 2006). This study also involves both a deductive process and an inductive process, which are used to test ideas and develop ideas (Check & Schutt, 2012). The quantitative method tested the idea of the potentials of using mobile devices for learning; the qualitative method developed ideas of students' experiences about engagement. A combination of quantitative and qualitative methods best answer the research questions with quantitative methods to produce numerical data and qualitative methods to obtain descriptive details (Check & Schutt, 2012).

The choice of a methodology is intimately and intricately connected to the epistemology I hold. The epistemological position fundamentally influences the methodology and methods: a methodology that retains a coherent positioning and methods that can best produce data to

answer research questions. My previous teaching experiences with a large number of students in College English classes motivated me to seek generalizable answers that could be applied to similar learning settings. Thus, using quantitative approaches to find a good manner to teach students, fitting most of them, is the beginning passion and goal for this research project. Yet, for all learners, including language learners, no matter how generalizable the research results are, their engagement in those activities varies from person to person. The unique individual experiences cannot be captured by numerical data, which need to be complemented by qualitative approaches, thus motivating me to embrace interpretive methods to capture thick, rich, and in-depth data.

For this dissertation study, the questionnaire and the photo-production visual method were implemented in the spring semester, 2021. The questionnaire was distributed to students through a survey website, Wenjuanwang. After the collection of questionnaires, students who showed willingness to participate in the visual section were contacted for producing photographs and being interviewed on a social media. Chwo et al. (2018) noted that in research studies of MALL, many researchers failed to recognize the potential influence of the novelty effect since they either ignored mentioning the duration of studies or had short-term tests, thus resulting in confounding variable and skewed data. They suggested that to avoid the novelty factor of new technological approaches in MALL, research should span at least 8 weeks. Given that the potential participants in this university started using mobile devices from the fall semester, 2020, novelty is no longer a factor to be concerned about.

Description of Mobile Activities

The use of mobile activities via Rain Classroom is part of the class design in two College English classes led by the same instructor at a university in China. During normal F2F classes,

students use mobile devices, either smartphones or tablets, to finish activities given by the instructor. Rain Classroom is a mobile learning platform developed in 2016, loading the functions of information publication for assignment submission and answer checking, multi-screen interaction between learners and lecturers, group discussions, and bullet screens (commentary shooting across the screen) for live conversations by text. This learning platform can be embedded in the three learning stages: previewing courseware for a preparation of the learning content and an activation of background knowledge, learning in the F2F lecturing time, and reviewing the content for post-class expansion (Gong, 2021). The mobile activities implemented on this platform can construct an interactive learning environment, allowing communication, interaction, and collaboration among the students or between students and instructors within the large-size English classes (Li & Song, 2018).

Prior to the F2F lecture, the instructor allocated previewing learning materials on Rain Classroom, such as PowerPoint slides of the forthcoming chapter, short articles related to the theme of the chapter, questions to think of in relation to the content of the chapter. Students previewed the learning materials as suggested by the instructor and marked anywhere they felt confused in the slides. Those learning materials helped raise students' prior knowledge of the related themes and keep record of students' confusion, which led to the instructor's explanations in details of the confusing sections.

During the in-class phase, a variety of mobile learning activities were embraced throughout the lecture. The instructor called attendance using Rain Classroom, thus keeping an accurate record of students' attendance to the lecture. When it came to the instruction of the lecture, the instructor displayed the PowerPoint slides on the projector screen, the content of which could be simultaneously played on students' devices of the Rain Classroom. With that

option, students could watch either the projector screen or their personal devices. Meanwhile, students could also make notes on their devices about each slide that could be kept as a record for review later. During the lecture, the instructor inserted activities that examined students' comprehension of the reading material or language skills, including but not limited to multiple-choice questions, sentence translation, and writing compositions. Students submitted answers by inputting from Rain Classroom on their devices. The instructor could see the results of students' responses right after they submitted and shared the results with the students. For multiple-choice questions, Rain Classroom could generate instant statistical results of each choice, thus navigating the instructor's discussions about the answers accordingly. Similarly, students' submission of writing compositions can also be presented on the projector screen, leading to the instructors' feedback, either verbally or in a written format. The instructor also randomly assigned students to online groups and asked them to work collaboratively through brainstorming and sharing information. All the groups uploaded their responses to Rain Classroom and shared with the whole class. Another commonly used feature of Rain Classroom is bullet-screens. The instructor raised questions and asked individual students to type bullet-screen comments, a type of live messages on the platform, for discussion, which could be shared with all students simultaneously by the instructor.

After the lecture, students could review the learning content that had been saved on Rain Classroom, including the materials allocated by the instructor and the notes taken by students. Post-lecture exercises were also distributed on Rain Classroom, by which students submitted answers. Again, students could always obtain a report of their answers, with comparisons of the average score of the whole class. In all, Rain Classroom has been used during the whole process of College English lecture for pre-, during, and after-class activities.

Ethics

Ethics clearance through the Research Ethics Board both at Brock University and the research setting, the university in China, was obtained before recruiting participants, which is the requirement for researching human participants (Tilley, 2016). The informed consent provided to participants is in Mandarin to ensure the comprehension of the document and have them fully informed of the purpose and the process of this study. It was clarified to the participants that participation in this research would allow them opportunities to reflect on their personal experience of using mobile devices for English learning. The participants were recruited to participate in the study voluntarily. They were informed of their rights to withdraw in the invitation letter and the informed consent. Withdrawal from the study would not affect the participants. Either participation or non-participation in the research would not affect their marks in the course. The participants were anonymous in their participation in the survey and were assigned pseudonyms in interviews, during which confidentiality was maintained throughout the research. Since the interview was through video conferencing online, the participants were fully made aware of recording the video or audio, which would be used only for this dissertation project to avoid ethical issues or concerns relating to recording. Since this study involves participant-generated photographs, the informed consent did not only entail permission to collect photographs but also included displaying them to audiences in different contexts (Reavey & Prosser, 2012).

Researcher Positioning

The mission of educating EFL learners formed my overriding interest in conducting this research project. The students' lack of motivational engagement in College English classes initially motivated my research goals of exploring the planning, alignment, and management of

activity designs in this compulsory course in a postsecondary school setting. How does teaching whet students' appetite and therefore contribute to students' motivation and involvement in classes? This question became an urgent issue to address. I felt a need to investigate activities that might diminish the resistance of learning English my students experienced. Thus, I hope to acquire practical teaching approaches to elicit students' best academic efforts. As such, my research inspiration and passion for conducting this research project are tied to my professional experiences. I chose this topic with which I have familiarity, interest, and curiosity and started with "where you are" (Lofland & Lofland, 1971), or *where I was*. Therefore, when conducting this research project, I made clear to students that I was a former College English teacher with a passion for and purpose of enhancing students' engagement in English classes. When interviewing students, I also encouraged them to reflect on their personal experiences of mobile learning activities to inform the improvement of College English class instructional designs.

While conducting interviews and analyzing data, I inhabited an insider identity of the researched because of the nationality, language, and culture we share. Using Chinese Mandarin to interview students made students feel comfortable and made it easier to share opinions. Being an insider represents recognizing and knowing participants' ontology and epistemology (Lofland & Lofland, 1971). Besides, it eliminates generating data that researchers want to hear but enables what the participants want to say, thus contributing to authentic perceptions from the researched (Milligan, 2016). Thus, the insider positioning helped me understand students' experiences, interpret data, and build a trustful relationship with the students, thus eliciting rich and thoughtful ideas.

Quantitative Descriptive Design

A descriptive quantitative research design is adopted to explore the potentials of mobile-assisted language activities on engagement. A descriptive survey can be used to explore the

characteristics of individuals and test a theoretical understanding of social processes (Berends, 2006). In this case, a questionnaire was used to examine MALL engagement framed within a social constructivist perspective. Given that the population of non-English major students is large, and the learners of College English can be more than a hundred in most university classes (Ju, 2013), the quantitative data can yield specific statistics (Creswell, 2012) about those students.

The instrument of students' engagement is a self-report questionnaire, the most commonly used method for assessing engagement for its ease to administer in classroom settings (Fredricks & McColskey, 2012). Besides its practicability in classrooms, quantitative self-report questionnaires are the most commonly used approach to measuring students' engagement of technology-mediated learning experiences. Also, questionnaires are the most effective in examining the psychological and cognitive aspects of engagement (Henrie et al., 2015). Although a variety of instruments were developed for measuring engagement, most of them do not apply to this research context because of their target at elementary school or secondary school students, such as: Engagement vs. Disaffection with Learning – Student Report; Identification With School Questionnaire; Motivation and Engagement Scale; and School Engagement Measure. Some instruments are widely used for the college level: the National Survey of Student Engagement (NSSE), for instance. Yet, NSSE is only applied to gathering institutional-level data as a whole but not for individual classes (Barkley, 2009).

Among various instruments, the Motivated Strategies for Learning Questionnaire (MSLQ) is an optimal option compared with other instruments. This instrument is course-level and can be applied to specific courses. MSLQ was developed by Pintrich and his colleagues in 1991, based on samples of college students. This questionnaire has been tested to examine college student engagement in both English- and non-English speaking countries and has been

widely applied in research (Fredricks & McColskey, 2012). In multiple studies, researchers demonstrated the validity and reliability of this instrument (Fredricks & McColskey, 2012; Tong et al., 2020). The construct validity of this instrument has been illustrated in the hypothesized direction based on theory (Pintrich et al., 1991). For instance, the learning strategies scales were positively correlated to course grade, representing the promising predictive validity of this instrument. This instrument's developers demonstrated that MSLQ had a relatively good internal consistency (Pintrich et al., 1991). The Cronbach's alpha of this engagement scale reported both by the developers and other users ranged from .63 to .88, close to the acceptance rate of .70 (Fredricks & McColskey, 2012).

MSLQ (see Table 1) consists of two scales, motivation and learning strategies, which are consistent with the definition of engagement of college students by Barkley (2009), who argued the factors of motivation and active learning. This instrument consists of 15 components, 81 questions in total. The section of motivation includes three value components, two expectancy components, and one affective component; the section of learning strategies consists of five cognitive and metacognitive strategies and four resource management strategies (Pintrich et al., 1991). The two scales of this instrument are questions with a 7-point Likert scale from 1 (not at all true of me) to 7 (very true of me). MSLQ has been translated into multiple languages, including a Chinese version, which has been validated in a study of 611 college students from two universities in China (Tong et al., 2020). The permission for using the Chinese version of this scale was obtained from the researchers. The questionnaire delivered to students was in the Chinese version to foster students' understanding of the questions. Demographic questions, such as age, gender, ethnicity, and major, were collected as a section in this questionnaire.

Table 1*The Scales and Components of MSLQ*

Motivation scales	Learning strategies scales
1. Value components <ul style="list-style-type: none"> a. Intrinsic goal orientation b. Extrinsic goal orientation c. Task value 	1. Cognitive and metacognitive strategies <ul style="list-style-type: none"> a. Rehearsal b. Elaboration c. Organization d. Critical thinking e. Metacognitive self-regulation
2. Expectancy components <ul style="list-style-type: none"> a. Control beliefs b. Self-efficacy for learning and performance 	2. Resource management strategies <ul style="list-style-type: none"> a. Time and study environment b. Effort regulation c. Peer learning d. Help seeking
3. Affective components <ul style="list-style-type: none"> – Test anxiety 	

In this research project, six components (25 questions) are included in the questionnaire, including intrinsic goal orientation, extrinsic goal orientation, task value, effort regulation, peer learning, and help seeking. The selection of those components is based on the relevance to the College English class mobile activity content and the aim of the study (i.e., investigating the influence of the mobile activities). Intrinsic goal orientation or intrinsic motivation, as the central motivator in the educational process, refers to being motivated by the activity itself because it is attractive and enjoyable with an inherent tendency to seek out novelty and challenges (Ju, 2013). Pintrich et al. (1991) indicate that the intrinsic goal orientation component examines the challenges of activities, students' curiosity, students' satisfaction, and mastery, thus indicating students' reasons for engaging in learning tasks; extrinsic goal orientation, on the contrary, represents students engagement from an external motivation, such as grades, rewards, and evaluation. The task value component reflects students' perception of the course materials and activities, such as usefulness, importance, and interests. Effort regulation includes questions

about students' self-control abilities, particularly in the face of difficulties and distraction, thus displaying students' engaging behaviours. Peer learning and help seeking represent students' interactions with peers and the instructor. This survey is developed based on a social cognitive view as indicated by Duncan and McKeachie (2005), since motivation is regarded as "dynamic and contextually bound" and learning strategies are "under the control of the student" (p. 117); learning is as an active information processing procedure with motivation and learning strategies varies depending on the nature of academic tasks.

Besides those course-level questions adopted from MLSQ, students also have an opportunity to express their perceptions in regard to the value of mobile learning in an open-ended question. Rather than choosing answers from the choices provided by researchers in the close-ended questions, participants have the flexibility to respond without restrictions from researchers in the open-ended questions. Reja et al. (2003) argued the advantage of open-ended questions over close-ended ones is that respondents will avoid suggesting responses and may give spontaneous answers to those questions. Similarly, Bengston et al. (2011) also indicated that open-ended questions would allow respondents to express answers beyond the predetermined, fixed response categories. Thus, it was expected that the open-ended questions may uncover students' perceptions that are not involved in the previous questions, extend students' opinions regarding mobile activities, or simply allow for final remarks or comments.

Photo-Production Visual Method and Interviews

A photo-production visual method is a research method that asks participants to take photographs using cameras and explores image-based experiences (Guillemin & Drew, 2010; Reavey & Prosser, 2012; Warr et al., 2016). As an approach mainly used by qualitative researchers to explore human experiences and to engage the participant in the research process

(Reavey & Prosser, 2012), participant-generated photos can act as tools for triggering memories (Frith, 2021; Mountian et al., 2021) of specific activities or scenes and revealing details of experiences (Pink, 2013). Compared with conventional qualitative methods, such as semi-structured interviews or focus groups, this method has the advantages of fostering a sense of participation and broaden the access to data collection (Guillemin & Drew, 2010; Roger & Blomgren, 2019). Specifically, this method overcomes the power imbalance between the researchers and the researched (Harley, 2012). The power in a research study can be shifted to the participants who can imitatively determine the usefulness and importance of data forming a sense of ownership and active control.

Reavey and Prosser (2012) suggested that since people are becoming familiar with new technologies to convey ideas, it is meaningful and significant for researchers to engage those technologies in research, thus generating richer data that embody human sensory stimuli besides conventional verbal data. Visual images, such as photographs taken by mobile phones, are important means of recording daily life and communicating with others. Students in English classes are exposed to various visual information: PowerPoint slides and videos, for instance. The information taken for granted every day can be representatives to answer the central question of qualitative research—people’s experiences and perceptions. A visual approach is also a way to closely listen to and engage participants as the image productions are central to and easy for participants’ life so that participants may feel confident and comfortable with producing images (Reavey & Prosser, 2012).

This research method has been widely used in psychological and sociological research studies, either with young kids or with adults. In previous research studies (e.g., Harwood et al., 2019; Lloyd et al., 2018), kids took photographs or videos to record their day of activities indoor

or outdoor, thus demonstrating ways of constructing psychological wellbeing. Some studies (e.g., Enright & O'Sullivan, 2012; Woodgate & Kreklewetz, 2012) used visual approaches as a data collection method for their life changes or historical memories. Visual methods have been successful with those participants, covering research topics on sexuality, identity, group processes, child development, and so forth in the disciplines of psychology, sociology, and gender studies (Reavey, 2021). However, this has been rarely applied to educational studies of language learning. Therefore, I applied this approach as a data collection method to exploring students' lived English learning experiences with visual supports.

The qualitative method and the survey complement each other while overcoming limitations in each method (Harris & Brown, 2010). Differing from the survey that produces generalizability from a large sample size, the visual method and interviews present lived experiences and insights on particular attitudes and thoughts of individual participants. Compared with traditional semi-structured interviews, the use of photographs can tap into a specific experience that includes details of time and space (Busso, 2021) of doing mobile-assisted activities and provide detailed records of events and occasions (Frith, 2021). Photos can be records of flashing ideas easily captured by cellphone cameras in seconds. Besides, the data collection of taking pictures can help with recruiting participants since it allows "a temporary escape from conventionalized routines of everyday schooling" (Enright & O'Sullivan, 2012, p. 45), and be less burdensome than data collection approaches that rely on writing such as keeping journals. When implementing the pilot study, I contacted individuals who finished the questionnaire and asked their willingness to participate in the following qualitative section. Many students refused when they heard that I would ask them to participate in an interview and told me they were not interested in or were unprepared for doing an interview. Later, I changed

my statement to “Would you like to take some pictures of mobile activities that you like or dislike, and we have a conversation in an interview to discuss those pictures.” Several students agreed to take pictures of their class activities and share learning experiences. This switch of the emphasis to taking and discussing pictures helped reduce students’ anxiety about participating in research in this case. The implementation of this visual method, therefore, was expected to promote the recruitment for the qualitative section.

This photo-production visual method involved three processes—training, taking photographs, and analysis—adapted from Warr et al.’s (2016) visual research method and tailored to this research project. Upon getting consent from the participants, I introduced this research method to students, including the training of taking pictures and ethics-related issues. The students who volunteered to participate used their cellphones or other devices to take five to 10 pictures/screenshots of the mobile-assisted activities assigned by the instructor or the process of doing activities. The following examples of taking pictures were provided to students: (a) the moments/status when you or you with your partners are involved in mobile activities (you might need other people to take pictures of you); (b) engaging mobile activity content, such as PowerPoint slides and screenshots of mobile activities; and (c) the ways you use mobile devices for personal English learning in or after class. The faces of students or the instructor, if any exist, could be covered by the participant who took the pictures to avoid the verification of identities and to maintain the confidentiality of participants. Ten students who took pictures were recruited and participated in an individual interview to discuss the pictures and related questions. Students chose five to 10 photographs that were the most relevant and significant to the research questions, displayed them in the interviews, and explained the content of pictures, reasons for taking them, and perceptions of mobile learning.

The interviews with the participants were semi-structured, containing seven questions with probes for some of the questions to elicit further information, elaboration, and clarification while the participants could maintain openness to responses (Creswell, 2012). Semi-structured interviews are especially beneficial for novice researchers, such as doctoral students, because of the opportunity for interviewees to extend answers to *a priori* questions and allow interviewers to keep more control of the interview compared with unstructured interviews (Tilley, 2016). The guide for asking questions during interviews was based on the SHOWED method produced by Hergenrather et al. (2009, p. 687) and modified to fit this particular research on perceptions of MALL as follows:

1. What do you See here?
2. What is really Happening here?
3. How does this relate to Our lives?
4. Why does this concern, situation, strength exist?
5. How can we become Empowered through our new understanding?
6. What can we Do?

Given that students were provided with various mobile-assisted activities, photos can help elicit specific memories of participating in the activities. Also, the photos can give me, the researcher, clear and concrete information of the mobile activities that students refer to. Thus, the visual data is of great support for participants and researchers because of the direct depiction of scenarios and experiences. In the following interviews, the participants explained the photographs they took since they are the most appropriate persons to provide meanings of the images they generated in case of inaccurate interpretations by researchers (Guillemin & Drew, 2010). Besides explaining the content of the photos, the participants also discussed their

perceptions of those mobile activities, including motivation and learning strategies. I asked them questions based on Pintrich et al.'s engagement components: motivation from the perspectives of intrinsic goal orientation and task value; learning strategies from the perspectives of metacognitive self-regulation, effort regulation, and peer learning (see Appendix C). I also asked them the interaction with the instructor and the collaboration with other students. The conversations of the interviews were audio-recorded for transcription and analysis. The interviews following the photo-production method are a continued reflexive process through which the participants comment on the photographs and the associated meanings in relation to the images (Reavey & Prosser, 2012).

Due to the global distance to the participants, the interviews were conducted online through social networking services familiar with Chinese students, such as QQ and WeChat. Online interviews have been considered the best choice other than the gold standard of F2F interviews. In recent years, online interviews have moved from a novel research approach to mainstream for the advantages of low cost, effectiveness, flexibility, heightened anonymity, the authenticity of interview data, and so on (Hewson et al., 2015; O'Connor & Madge, 2017), realizing "rich, intimate, personal exchanges" online (Hewson et al., 2015, p. 51). Particularly, synchronous interviews using social applications for real-time communication familiar with teenagers and university students turned out to be the most suitable approach to interviewing (O'Connor & Madge, 2017). The students in the College English classes are mostly young adults born in the digital age and have been exposed to mobile activities. The online interview is similar to what they have done in English classes, including real-time text-based messaging and video/audio communication. Students made the choice of a social networking app that features instant messaging and video/audio-based technology for the interview. We had either a video or

audio conversation based on students' preferences. The students were also encouraged to leave instant messages on social networking services about their perceptions of mobile activities anytime.

To foster trustworthiness, I made explicit explanations of all the processes and details of conducting and analyzing the qualitative visual methods so that the participants were clear about the research process. Participants who are interested in the research results will be given a final manuscript of the study. Therefore, transparency of the visual methods was the primary consideration to foster validity which leads to trustworthiness, making the study visual and auditable (Rolfe, 2006).

Data Collection

The two College English classes in the university that were involved in this study consisted of first-year undergraduate students of various majors. The student number in each of the English classes was approximately 100 (226 students in total). The two classes, taught by the same instructor, were using mobile learning platforms for implementing pre-, during-, and post-class activities, such as in-time response, group work, and bullet-screen comments, as mentioned above.

I recorded a recruitment video that explained the research components involved in the study, including the research purpose, research methods, ways to participate, and contact information. On the 8th week of the spring semester 2021, the instructor introduced me, a student investigator, who would conduct a research project in his classes. He played the video that I recorded and handed out the letters of invitation. To avoid any pressure from the instructor, I invited students who were willing to participate in the project to contact me directly via email or WeChat, as shown in the letter. I sent them the consent forms and collected the forms from those

who volunteered to participate. In the consent form, students indicated whether they would participate in the survey, the qualitative visual method, or both. A ¥25 gift card was randomly provided to one out of five students who participated as an encouragement for students' participation in the survey.

The recruitment of participants for the survey was from these two classes and 206 students finished the questionnaire, resulting in an answering rate of 91% among all the students. I randomly chose 15 participants from the students who left contacting information in the questionnaire for the qualitative study section and introduced the qualitative visual section of the project via WeChat or QQ. Patton (1990) introduced the meaning of using random sampling method that, while selecting a small sampling does not represent the whole population of this program, it still maintains the advance of credibility and comprehensive information collection.

The number of participants was based on the standard of a saturation point which means that when information from participants repeats again and again, researchers discontinue sampling and data collection (Saunders et al., 2018). In the pilot study I conducted, I recruited five students from the two classes and similar comments from students occurred; in this dissertation project, I decided to recruit more students (10 students) than those in the pilot study to confirm that there were no new themes generated and thus establish sampling saturation. After recruitment, seven of the students sent the photographs through WeChat and QQ and participated in the personal interviews whereas the other three of them did not send photographs or respond to my messages. After collecting data from the seven students, to guarantee a saturation point was met, I used a snowball sampling method to recruit another three participants for the visual method section. In the end, 10 students finished the photograph and interview section of the research project.

Students took photographs from the College English class and their after-class mobile learning activities. Each of the students was asked to take five to 10 photographs of mobile-assisted learning moments from the 8th week till the 13th week of the spring semester, over 6 weeks. Finally, they sent me 71 photographs of their mobile learning activities with an average of seven pictures per participant. Among all the photographs, 35 were taken during the College English lecture and 36 were taken in students' spare time (e.g., when studying in the dorm or in the library). In students' photographs, 62 of them were taken in specific learning locations whereas nine were screenshots of learning apps on cellphones.

Data Analysis

The questionnaires, interviews, and photographs created a large amount of data to be analyzed. The three types of data were analyzed separately first, followed by joint analysis to provide answers to the two research questions. The questionnaires were analyzed using SPSS Statistics, with a descriptive analysis and a Person Correlation generated. The interviews were transcribed and coded into multiple codes for thematical analysis. The photographs were categorized into several types according to the content.

The data collected via questionnaires were inputted into SPSS Statistics, a commonly used statistical analysis software. Participants' demographic information and the answers to all engagement-related questions showed up after a descriptive analysis, including means, median, modes, and standard deviations. The answers were scored on a 7-point Likert scale from "not at all true of me" to "very true of me," following the manual of the survey (Pintrich et al., 1991). The means are used as a standard measure of the center of the distribution (Miles & Banyard, 2007). The results of all the answers are listed in a table. The mean scores of the six components, intrinsic goal orientation, extrinsic goal orientation, task value, effort regulation, peer learning,

and help seeking, were described, thus indicating learners' engagement in these mobile-assisted classes. The results from this study and the norm from the MSLQ manual have been compared. A correlation among the six scales was calculated by the test of Pearson Correlation. For this test, I manually copied the responses in each variable/question and pasted them into a new variable so that the new variable contained all the responses to one scale. I completed this process for all six scales, which became six new variables. I ran the test of Pearson Correlation of the six variables to generate correlation scores, which have been compared to those in the MSLQ manual. All the results are displayed in Chapter 4. For the open-ended questions in the questionnaire, most students did not provide answers and a few students typed several words such as “我喜欢这门课 (I like the course)” and “非常好 (It is very good)”, which were not considered into analysis.

For the interviews, the conversations recorded were transcribed manually word for word. The participants were contacted for a chance to do member checking to evaluate the transcript and determine the accuracy (Yilmaz, 2013), which may involve behaviours of questioning, critiquing, giving feedback, affirming information, and collaborating (Tracy, 2010). Professional translators translated the transcripts from Chinese to English and I checked the accuracy based on the conversation contexts. I made *a priori* codes based on the conceptual framework and the theoretical framework, such as interactive relationships, collaboration with peers, motivated behaviours, self-regulated learning, and active learning. I input the transcripts into NVivo, a qualitative software program for coding and coded with *a priori* codes and emergent codes. Table 2 presents codes and examples of quotations.

Table 2*Codes and Examples From the Transcripts*

Code	Quotation examples
Communication among students after class	“There was a time when we discussed for the arrangements of a sitcom, like who would be the one to compose the script and who to perform, we discussed all these on QQ.”
Learning efficiency	“It [working on mobile devices] makes learning more efficient, because it eliminates a lot of time-consuming things like teachers handing out test questions or picking classmates.”
Choice of devices	“I use my mobile phone in class...[it] is easier to carry.” “I usually also use the computer to look up new words.” “If you are reading PowerPoint slides or taking an exam, it is more comfortable to look at a tablet than a mobile phone.”
Frequency of using personal devices	“About three times a week.”
Take notes easily	“It is also convenient for us to write notes after class, like Rain Classroom, it uses the PowerPoint slides presented by the teacher, once we have data after presenting in the class, we can replay it to the content that the teacher talked about in class.”
Functions of personal use apps	“Since there will be [activities about] CET-4, I also enhance my English ability by using other apps.”
Review	“The coursework assigned by teacher and the PowerPoint slides for lesson were easily visible in the app, so that we could review the previous study material with ease.”
Preview	“The preview will be more convenient, and the key points will be clearer as well.”
Ways of solving problems	“I usually look up on the Internet first to see if I can find the answer, and if not, I will ask the teacher.”
Benefits of Rain Classroom	“After the class report, there will be an average score of the class as a whole and your own average score, as well as the total number of classmates and your ranking in between.”

Table 2 (cont'd)*Codes and Examples From the Transcripts*

Code	Quotation examples
Benefits of using other apps	“It enables me to enhance my vocabulary size, which is particularly essential for English learners.”
Extrinsic motivation	“Actually, I always feel that my motivation to learn English is to get passed at CET-4.”
Intrinsic motivation	“Secondly, it feels very relaxed to use it and usually reduces the awkwardness about answering the questions in class.”
Functions of Rain Classroom	“We can answer questions on mobile phone, and teachers will be able to check in on our answers on the server side. He knows exactly which questions are well answered and which are not.”
Drawbacks of mobile learning	“If we study via mobile phone, it definitely can't get rid of a problem, which is to be distracted during study, such as an incoming notification will interrupt our study.”

Codese that have relations in the transcripts were grouped into categories that were compiled into broader themes. For instance, students indicated several types of devices used for learning activities as coded as *Choice of Devices*. They also mentioned learning through personal devices for *Preview* and *Review*. Thus, those similar codes were grouped into the bigger theme of cellphones as the major learning devices for seamless learning. In this way, another five themes also emerged from the analysis of those codes, including a support for inquiry between students and the instructor, more possibilities for independent learning, elevated learning efficiency; learning for higher grades; and drawbacks of mobile learning.

Subsequent to the process of analyzing questionnaires and interviews separately, common themes that appeared across the two types of data were also identified and I made a comparison in a joint table that displayed quantitative and qualitative findings side by side as

suggested by Creswell and Clark (2018). A joint display table is an explicit approach to present data obtained from mixed methods for a direct and nuanced comparison regarding key topics by integrating quantitative results and qualitative exemplar quotes. Furthermore, the side-by-side analysis of mixed methods is regarded as an approach to support or refute the statistical results (Creswell, 2012).

For instance, the category of Extrinsic Motivation generated from the interviews is closely related to the scale of Extrinsic Goal Orientation in the questionnaire; thus, direct quotations of Extrinsic Motivation are parallel with this scale for complementary data on the same topic. I expect to see congruent results from the two types of data, meaning consistency of findings from the two approaches. In light of discrepant results, I explain how the results are incongruent. I provide my interpretations regarding congruent and incongruent findings.

The photographs produced by students were grouped in two ways in accordance with the content. I first identified the existence of mobile devices and categorized the photographs according to the type of devices (cellphones, tablets, and laptops) for accessing learning resources. In the following step, I reviewed closely the content of the mobile learning activities presented in those photographs and separated them into two learning conditions: activities for College English lectures and activities for independent learning. A detailed description of the photographs is discussed in Chapter 4.

The images and interviews in the analysis process are intertwined and analyzed simultaneously (Guillemin & Drew, 2010). As argued by Reavey and Prosser, the meaning of visual does not simply focus on the image itself but is more concerned with perceptions and meanings that are attributed to these visual objects (Yilmaz, 2013). The data analysis process followed Majumdar's (2012) photo production analysis method: "Each interview was analysed

by paying attention to the sequencing or thematic arrangement of photos in each interview along with participants' narrative meaning making around them" (p. 77). I first considered whether there is a particular chronological order of participants' narratives of the learning experience. I also paid close attention to the participants' images by grouping photographs that are linked between them, from where themes of the photographs emerged (Drew & Guillemin, 2014). I adopted Rose's (2016) interpretive questions of critical visual methodology to analyze the photographs. Examples of questions are "What is being shown? What are the components of the image? How are they arranged?" (Rose, 2016, p. 346). This process engaged me with the details of images and I interpreted them deliberately and systematically (Drew & Guillemin, 2014). Since their photos were about class activities, there is a possibility that participants photographed similar objects and spaces. So, I related all photographs and narratives of similar categories across all the interviews.

Chapter Summary

This chapter presented a description of the methodology and methods used in this study. I adopted a mixed methods design (online questionnaires, participant-generated photographs, and semi-structured personal interviews) to explore learners' engagement. The integration of multiple data collection approaches is expected to provide a comprehensive view of students' perceptions and experiences of MALL. In the following chapter, I present the findings from quantitative and qualitative approaches and integrate them to answer the two research questions.

CHAPTER FOUR: RESEARCH FINDINGS

The purpose of this study was to examine the influence of MALL on Chinese undergraduate students' engagement, including their motivation and active learning strategies for learning College English through mobile assisted learning. This chapter presents the analysis of data gathered through questionnaires, photographs, and student interviews. It is structured to explore the two major research questions that guided this study:

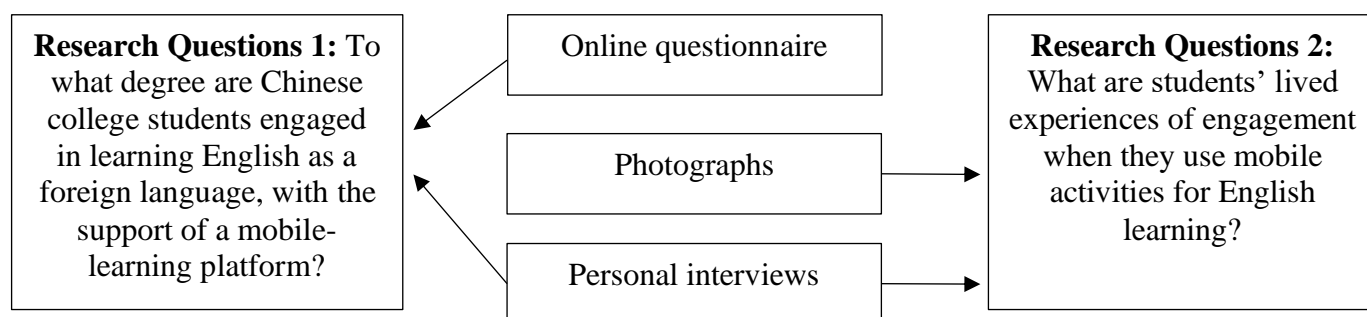
1. To what degree are Chinese college students engaged in learning English as a foreign language, with the support of a mobile-learning platform?
2. What are undergraduate university students' lived experiences of engagement when they use mobile activities for English learning?

This study adopted a convergent mixed methods design, namely an online questionnaire to collect students' perceptions of motivation and learning strategies of mobile-assisted college English learning and a photo-production visual method to gather photographic evidence of students' learning moments and conversations in interviews. As discussed in previous chapters, the outbreak of the COVID-19 pandemic provoked the implementation of mobile learning through Rain Classroom in F2F learning settings. The quantitative and qualitative data collected from students were from the second semester after students had returned to campus for F2F learning. Those research methods were employed to collaboratively address the two research questions. Figure 2 summarizes the research questions and findings from data collection methods. The first research question was partially addressed by the questionnaire results that contain motivation scales (Extrinsic Goal Orientation, Intrinsic Goal Orientation, and Task Value) and learning strategies scales (Effort Regulation, Help Seeking, and Peer Learning). Some of the questionnaire questions were also introduced in the interviews to explore the

influence on learner engagement further. Thus, the interviews also elaborated on the first research question by providing supporting evidence and, sometimes, contradictory findings to the quantitative results. The second research question was addressed by personal interviews and photographs, which were analysed and combined to provide linguistic and visual data of learner engagement both during the lecture and in their spare time.

Figure 2

Research Questions and Data Collection Methods



The following sections introduce the findings from the questionnaire, photographs, and personal interviews. First, I present results from questionnaires that report students' self-evaluation scores of engagement scales. Second, I integrate some of the interview findings that are related to the engagement scales for a mixed methods analysis and display them in a joint display table as suggested by Creswell and Clark (2021). The first two sections of this chapter provide answers to the first research question. In the third section, I display the findings from photographs followed by an analysis of personal interviews to answer the second research question.

Results From Questionnaires

The results from questionnaires composed of demographic information of participants, the current status of students' usage of mobile devices, and a summary of reported scores of

MSLQ, encompassing six scales: Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Effort Regulation, Peer Learning, and Help Seeking.

Participants

The participants in this study are 206 first-year university students enrolled in various majors in a university in Northern China. The majority of the students were female ($n=138$, 66.99%), and 33.01% ($n= 68$) were male. The average age of the students was 19.21 ($SD=1.65$). Students of Chemistry and Chemical Engineering occupied the highest percentage (16.50%) followed by students of Computer Science and Technology (14.56%). Table 3 presents descriptive statistics of students' majors.

Table 3

Descriptive Statistics of Students' Majors

Major	Percentage
Chemistry and Chemical Engineering	16.50%
Computer Science and Technology	14.56%
Linguistics	8.25%
History	8.25%
Biological Science and Technology	6.80%
Business Administration	6.31%
Education	6.31%
Physics	5.34%
Economics	4.85%
Electrical Information	4.85%
Laws	4.37%
Mathematics	3.88%
Journalism and Communication	2.91%
Machinery	2.43%
Administrative Science and Engineering	0.97%
Psychology	0.97%
Information and Technology	0.49%
Arts	0.49%
Agriculture	0.49%
Environmental Science and Safety	0.49%

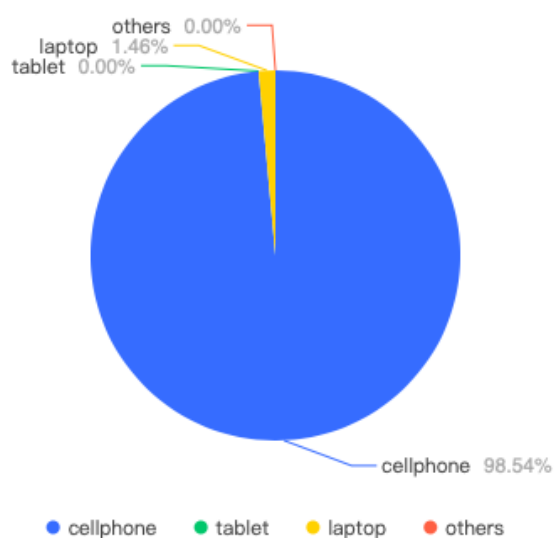
Philosophy	0.49%
Total	100%

Students' Usage of Mobile Devices for College English

As displayed in Figure 3, the choices of mobile devices for College English use are divided into two types: cellphones and laptops. The vast majority of students ($n=203$, 98.54%) used cellphones for English learning, while only three students (1.46%) used laptops.

Figure 3

Devices Used by College English Students for University Learning



Results From MSLQ

As described in previous chapters, MSLQ (Pintrich et al., 1991) was used to measure the influence of mobile learning activities on student engagement. This 7-point Likert scale questionnaire included six scales (Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Effort Regulation, Peer Learning, and Help Seeking), consisting of 26 questions. Three of the questions (questions 15, 17, and 19) are negatively worded. For those negatively worded

questions, the scores from students have been converted to positive ones by subtracting the original scores from 8 as instructed by the manual of MSLQ (Pintrich et al., 1991). For instance, in question 15, which is an examination of students' effort regulation, the expression "give up" was used for students' negative engagement. The original mean score of this question was $M=3.73$, which was reverted to a positive score $M=4.27$ to represent students' positive effort regulation. Table 4 displays the descriptive statistics of those scales, including mean and standard deviation from the current study and those from the test manual.

Table 4

Means and Standard Deviations of Scales in the Current Study and in the Manual

Scales and Questions	Sample Mean	Sample SD	Norm Mean	Norm SD
Extrinsic Goal Orientation	5.36	1.45	5.03	1.03
1. Getting a good grade in this class is the most satisfying thing for me right now.	5.45	1.48		
2. The most important thing for me right now is improving my overall grade point average so my main concern in this class is getting a good grade.	5.24	1.37		
3. If I can I want to get better grades in this class than most of the other students	5.88	1.22		
4. I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.	4.86	1.55		
Task Value	5.36	1.42	5.54	1.25
5. I think I will be able to use what I learned in this course in other courses.	5.42	1.50		
6. It is important for me to learn the course material in this class.	5.60	1.36		
7. I'm very interested in the content area of this course.	5.01	1.42		
8. I think the course material in this class is useful for me to learn.	5.45	1.40		
9. I like this subject matter of this course.	5.10	1.37		

10. Understanding the subject matter of this course is very important for me.	5.56	1.44		
Intrinsic Goal Orientation	4.95	1.44	5.03	1.09
11. In a class like this I prefer course material that really challenges me so I can learn new things.	4.88	1.41		
12. In a class like this I prefer course material that arouses my curiosity even if it is difficult to learn.	4.80	1.44		
13. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.	5.23	1.33		
14. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.	4.88	1.55		
Effort Regulation	4.61	1.67	5.25	1.10
15. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.	4.27 (reversed)	1.93		
16. I work hard to do well in this class even if I don't like what we are doing.	5.06	1.44		
17. When coursework is difficult, I give up or only study the easy parts.	4.09 (reversed)	1.66		
18. Even when course materials are dull and uninteresting, I managed to keep working until I finish.	5.00	1.40		
Help Seeking	4.30	1.62	3.84	1.23
19. Even if I have trouble learning the material in this class, I try to do the work on my own without help from anyone.	3.78 (reversed)	1.49		
20. I asked the instructor to clarify concepts I don't understand well.	4.00	1.62		
21. When I can't understand the material in this course, I asked another student in this class for help.	4.78	1.58		
22. I try to identify students in this class whom I can ask for help if necessary.	4.65	1.59		
Peer learning	4.27	1.61	2.89	1.53
23. When studying for this course I often try to explain the material to a classmate or a friend.	4.14	1.59		
24. I try to work with other students from this class to complete the course assignments.	4.62	1.58		

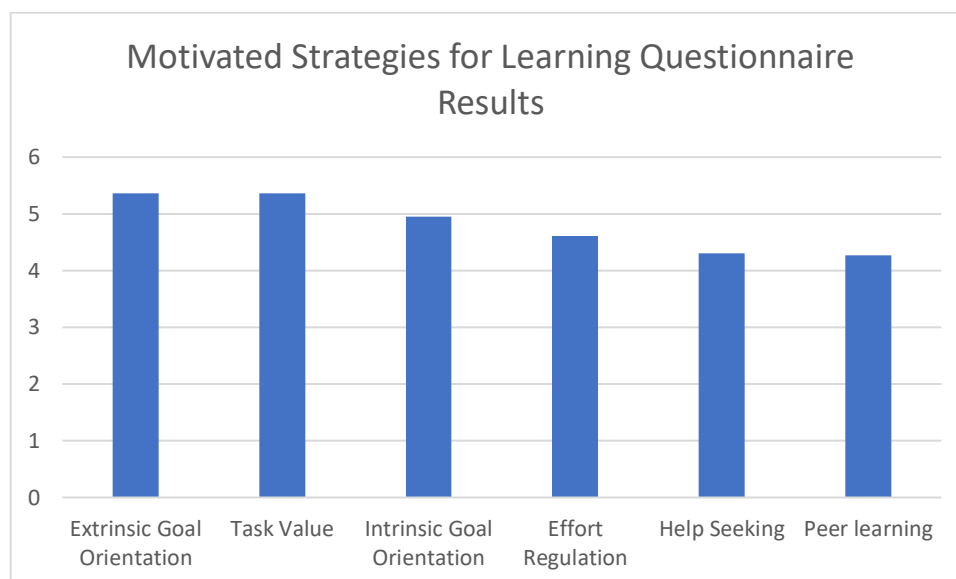
25. While studying for the scores I often set aside time to discuss the course material with a group of students from the class.	4.07	1.60
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Note. All scores are rounded up to two decimal points.

The means of those scales ranged from 4.27 to 5.36 on a scale from 1 to 7, meaning that students in College English classes rated their engagement in this course above the average of 3.5 for all the categories (see Figure 4 for a comparison of means of those scales). This result shows that students perceived their motivational beliefs (Extrinsic Goal Orientation, Task Value, and Intrinsic Goal Orientation) and active learning strategies (Effort Regulation, Help Seeking, and Peer Learning) higher than an average level. Additionally, the motivational scales (Extrinsic Goal Orientation, Task Value, and Intrinsic Goal Orientation) were all higher than learning strategies scales (Effort Regulation, Help Seeking, and Peer Learning).

Figure 4

Motivated Strategies for Learning Questionnaire Results



As indicated in the bar chart, scales Extrinsic Goal Orientation ($M=5.36$, $SD=1.45$) and Task Value ($M=5.36$, $SD=1.42$) have the identical highest mean scores. Students reported their

motivation to learn English mainly because of extrinsic reasons. Getting better grades than other students ($M=5.88$, $SD=1.22$) is the most significant motivator followed by getting a good grade ($M=5.45$, $SD=1.48$), improving overall grade point average ($M=5.24$, $SD=1.37$), and showing abilities to my family, friends, employer, or others ($M=4.86$, $SD=1.55$). Figure 5 shows a comparison of the means scores of those motivators. The students also recognized the value of the tasks in this course ($M=5.36$, $SD=1.42$). As illustrated in Figure 6, they scored high for the importance of learning materials ($M=5.60$, $SD=1.36$) and the significance of understanding the subject matters of this course ($M=5.56$, $SD=1.44$). The score of students' Intrinsic Goal Orientation ($M=4.95$, $SD=1.44$) is lower than that of Extrinsic Goal Orientation ($M=5.36$, $SD=1.45$) and Task Value ($M=5.36$, $SD=1.42$). Though they reported high scores on trying to understand the content as thoroughly as possible ($M=5.23$, $SD=1.33$), their ratings of willingness to choose challenging materials ($M=4.88$, $SD=1.55$) and difficult materials ($M=4.80$, $SD=1.44$) are comparatively lower (see Figure 7).

Figure 5

Scores of Extrinsic Goal Orientation

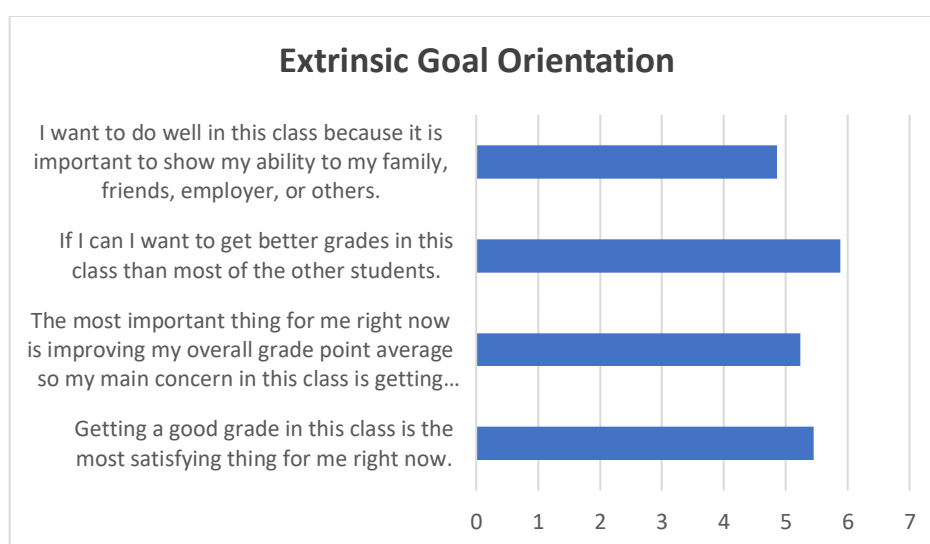
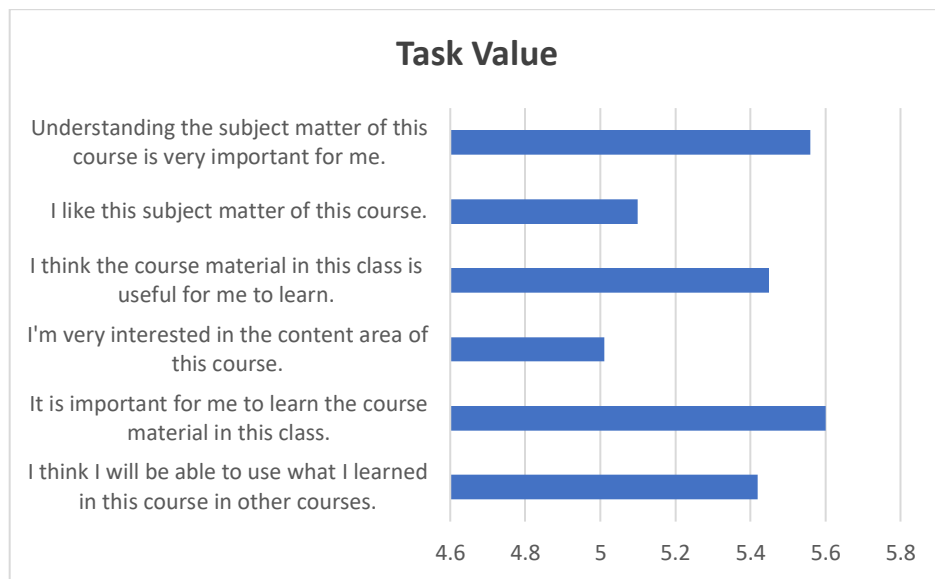
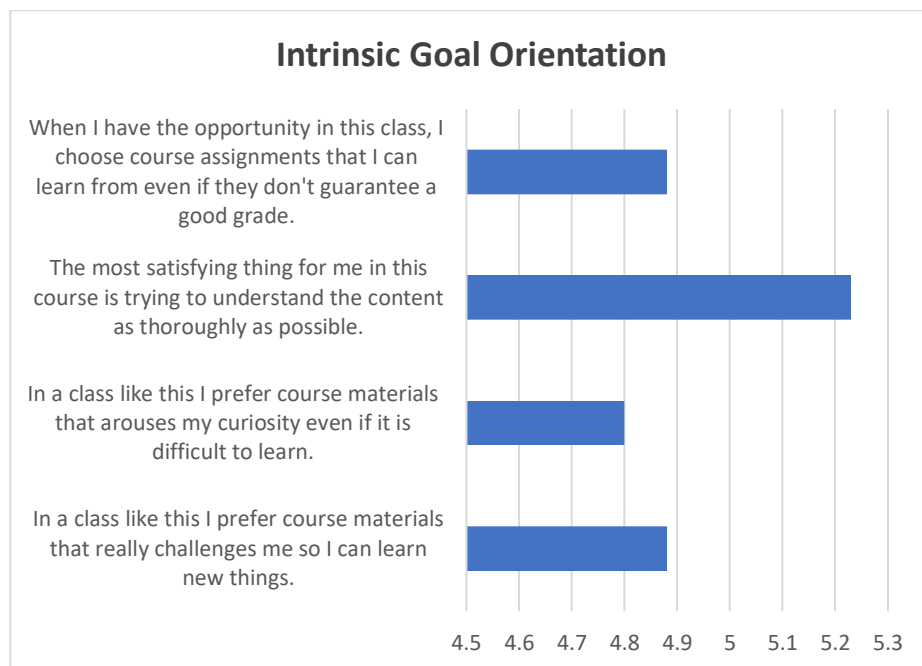


Figure 6*Scores of Task Value***Figure 7***Scores of Intrinsic Goal Orientation*

In terms of learning strategies, students had higher ratings in their reports of working hard to do well ($M=5.06$, $SD=1.44$) and keeping working until finish ($M=5.00$, $SD=1.40$) in the scale of Effort Regulation (see Figure 8). The results also showed relatively lower scores in the scales of Help Seeking ($M=4.30$, $SD=1.62$; see Figure 9) and Peer learning ($M=4.27$, $SD=1.61$; see Figure 10). Students reported that they tended not to seek help when they have trouble learning the materials ($M=3.78$, $SD=1.49$). For peer learning, the scores showed students' more willingness to work with other students to complete the course assignments ($M=4.62$, $SD=1.58$) other than explaining the material to a classmate or a friend ($M=4.14$, $SD=1.59$) and set aside time to discuss the course material with a group of students ($M=4.07$, $SD=1.60$).

Figure 8

Scores of Effort Regulation

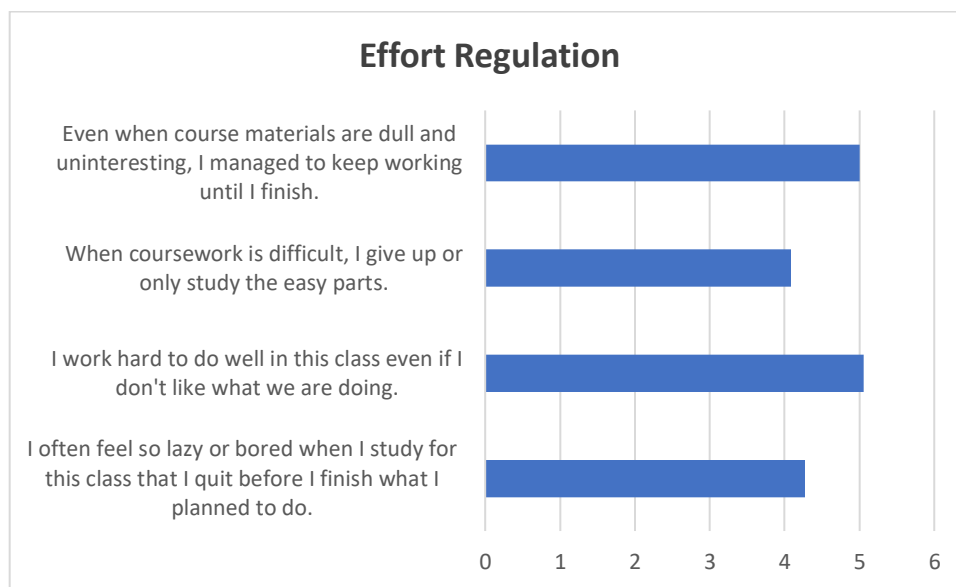
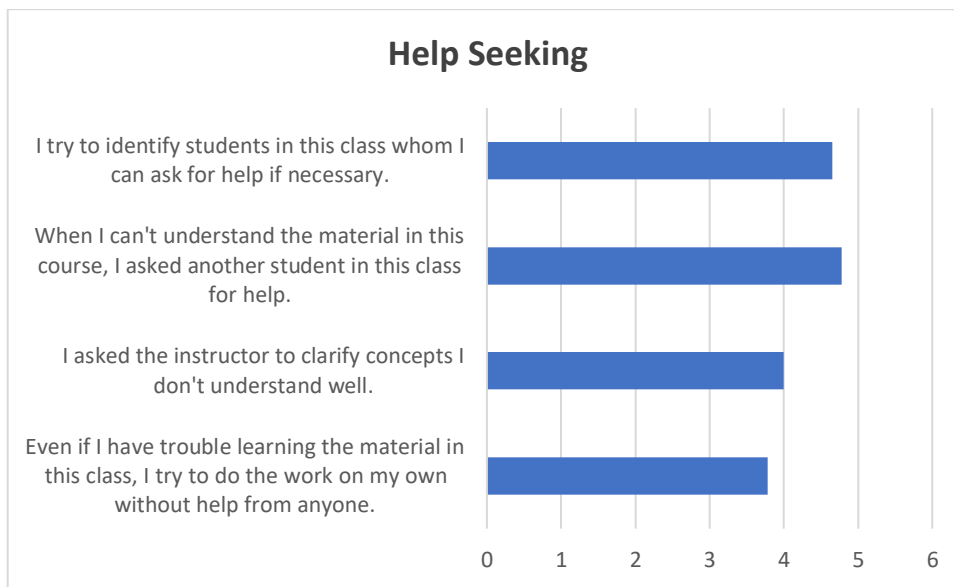
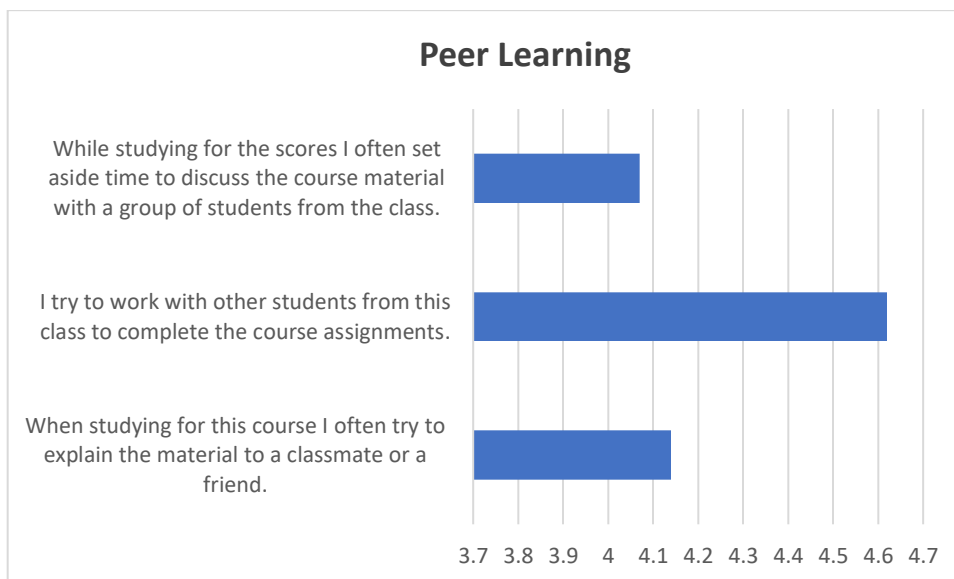


Figure 9*Scores of Help Seeking***Figure 10***Scores of Peer Learning*

Compared with the norm mean and standard deviation provided by Pintrich et al. (1991), students' extrinsic goal orientation score ($M=5.36$, $SD=1.45$) was slightly higher than expected based on the data provided in the test manual ($M=5.03$, $SD=1.03$; Pintrich et al., 1991). A similar phenomenon also happened in Help Seeking. Also students in the mobile-assisted College English class reported that they tended to seek more help from others who are more knowledgeable ($M=4.30$, $SD=1.62$) than those from Pintrich et al.'s (1991) test ($M=3.84$, $SD=1.23$). Surprisingly, reports of peer learning in College English class ($M=4.27$, $SD=1.61$) was significantly higher than that in the test manual ($M=2.89$, $SD=1.53$). Yet, students' report of effort regulation in learning English ($M=4.61$, $SD=1.67$) is slightly lower than that in the test manual ($M=5.25$, $SD=1.10$).

A Pearson correlation was conducted to examine how any two variables move together and how strongly one variable moves in relation to other variables. The correlation coefficients among those variables and those coefficients from the test manual (in parenthesis) are reported in Table 5. As indicated in the correlation table, students who perceived more task value in mobile learning activities maintained higher intrinsic goal orientation ($r = .68$, $p < .01$) and extrinsic goal orientation ($r = .60$, $p < .01$) towards English learning. Students who sought help reported more positive feelings toward peer learning ($r = .64$, $p < .01$).

Particularly, in comparison with the coefficient from the test manual, the correlation between Task Value and Extrinsic Goal Orientation ($r = .60$, $p < .01$) is more significant than that in the test manual ($r = .18$, $p < .01$). Similarly, the correlation coefficient between Extrinsic Goal Orientation and Intrinsic Goal Orientation ($r = .53$, $p < .01$) is also higher than that in the test manual ($r = .15$, $p < .01$).

Table 5*Correlations Between Six Variables*

Variable	1	2	3	4	5	6
1. Extrinsic	-					
2. Task value	.60* (.18)	-				
3. Intrinsic	.53* (.15)	.68* (.68)	-			
4. Effort regulation	.30* (.11)	.56* (.47)	.39* (.43)	-		
5. Help seeking	.28* (.08)	.43* (.16)	.43* (.10)	.29* (.18)	-	
6. Peer learning	.30* (.20)	.49* (.09)	.44* (.13)	.26* (.05)	.64* (.55)	-

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

The results from the questionnaire showed that students reported an extremely strong preference for cellphone use among all the devices when they were engaged in College English mobile learning activities. Among all the scales, the questionnaire indicated highest scores of students' self-assessed Extrinsic Goal Orientation and Task Value. They reported higher-than-average scores in the Likert scale questionnaire of all the six scales of their motivational beliefs (Extrinsic Goal Orientation, Task Value, and Intrinsic Goal Orientation) and active learning strategies (Effort Regulation, Help Seeking, and Peer Learning). The scores of some of the scales (Extrinsic Goal Orientation, Help Seeking, and Peer Learning) were higher than the scores in the test manual. The correlations between some of the scales, (e.g., Task Value & Extrinsic Goal Orientation and Extrinsic Goal Orientation & Intrinsic Goal Orientation) are more significant than those in the test manual.

Mixed Methods Findings

In order to better understand the influence of mobile-assisted learning activities on students' engagement, findings from the interviews that were related to the engagement scales were compared with the quantitative results in a joint display table for direct and nuanced comparison (Creswell & Clark, 2018). Through analyzing data according to key topics and results from the quantitative section and the qualitative section, I expect to provide “a more direct and nuanced comparison of the results” (Creswell & Clark, 2021, p. 228) and to present both congruent and discrepant results from the two types of information. The comparison and the merging of data resulted in overall consistency between the two data sets. Most of the qualitative findings confirmed and complemented the quantitative statistical results (as in the scales of Extrinsic Goal Orientation, Task Value, Help Seeking), with some results diverged between the two sets of data (as appeared in Intrinsic Goal Orientation, Effort Regulation, and Help Seeking). In Table 6, the topics from the quantitative scales, relating quantitative results, relating qualitative quotes and inferences are displayed to present a joint result of the two research methods (students were assigned pseudonyms).

The qualitative information confirmed and expanded the statistical descriptions for some of the scales, such as Extrinsic Motivation, Task Value, and Help Seeking. University students learned English mainly using an extrinsic motivation and Rain Classroom and other learning platforms supported their needs for achieving that goal. They recognized the value of not only English subjects but also mobile learning activities. By submitting answers to Rain Classroom, they received corrective feedback and improved linguistic skills. They further explained that the internet was the priority resource that students relied on when encountering learning issues, from where they sought wiser solutions from knowledgeable individuals or artificial intelligence on mobile devices.

Table 6*A Joint Display of Mixed Methods Findings*

Topics	Quantitative results	Qualitative quotes	Inferences
Extrinsic Goal Orientation	Students indicated that their engagement in College English learning was mainly towards an extrinsic motivation, such as grade, rewards, performance, and evaluation by others ($M=5.36$, $SD=1.45$).	<p>Actually, I always feel that my motivation to learn English is to pass CET-4 (Interview, Jie Lun).</p> <p>I think it [the in-class exercise] is pretty good, because it is linked to the final grading, so if I get a better score here, it will be easier for me at the end of the semester (Interview, Wang Kai).</p> <p>At the end of the semester, your class performance rate will be slightly higher than others'. Since you have quick and good answers, the instructor can give you a Like, which is also a motivator (Interview, Li Su).</p>	Students' participation in College English learning was mainly driven by extrinsic motivation. They expected to maintain high grades by participating in activities, tasks, and questions submitted through mobile devices, which provided them more accessible ways to do so. They also hoped to make achievements in CET-4. In-class exercises supported the necessary skills for passing CET-4 through Rain Classroom and other apps they used.
Task Value	Students evaluated mobile learning activities as interesting and important and understood the usefulness of the learning materials ($M=5.36$, $SD=1.42$).	<p>I think these are quite useful for me. In particular, apps like Rain Classroom allow instructors to provide us with real-time feedback and explain the key types of questions (Interview, Su Shan).</p> <p>I think this is quite meaningful [to preview questions on Rain Classroom]. You can understand what the chapter is about through these questions (Interview, Wang Kai).</p>	Students understood the significance of mobile-assisted activities for English learning, such as obtaining feedback of submitted answers and previewing questions related to the upcoming learning content. Rain Classroom made the process of submitting and viewing answers efficient. Thus, students recognized the usefulness of those learning materials and the helpfulness of mobile platforms.

Intrinsic Goal Orientation	Students perceived the mobile learning activities supported their intrinsic motivation, such as being willing to take challenges and maintaining curiosity in learning ($M=4.95$, $SD=1.44$)	<p>I feel like it aroused my interest in learning English since I am eager to know how many of my answers are correct (Interview, Shang Jia).</p> <p>I think all these [apps] can increase my study efficiency and also my interest in it (Interview, Su Shan).</p> <p>There are also bullet screens, which I feel are quite interesting, because I increased my interest in learning English than before (Interview, Li Su).</p> <p>For usual motivations, no matter whether mobile devices are involved or not, I don't think there is a big change in the learning motivation (Interview, Jie Lun).</p>	Most of the students in the interviews confirmed that mobile learning activities elevated their learning interest and curiosity because they could choose learning materials according to their personal needs and enjoyed communicating with others through typing messages. Yet, some students mentioned that their intrinsic motivation did not differ.
Effort Regulation	Students presented the ability to control their effort and control attention even when facing difficulties and distractions ($M=4.61$, $SD=1.47$).	<p>There are more ways available for me to learn autonomously (Interview, Shang Jia).</p> <p>Some software has the function of keeping daily attendance. Sometimes I do not want to break the consistency, so I keep taking attendance on it (Interview, Lu Yu).</p> <p>Very often many students will be distracted from studying to playing (Interview, Su Shan).</p> <p>It may be unavoidable that our attentions are sometimes distracted (Interview, Jie Lun).</p>	Some students agreed that Rain Classroom made previewing and reviewing easy to achieve, and mobile learning activities opened new ways for autonomous learning. However, several students showed concerns about the distractions caused by mobile devices. Thus, students' self-regulation seemed not able to be well maintained when using mobile devices for learning.

It is easy to be disturbed when I play on my mobile phone because of messages from QQ and WeChat, or a courier sometimes (Interview, Shan Shan).

Help Seeking	Students could identify someone to provide assistance and support, such as peers and instructors ($M=4.30$, $SD=1.62$).	<p>I usually lookup on the Internet first to see if I can find the answer, and if not, I will ask the instructor (Interview, Lu Yu).</p> <p>If I encounter something I do not know, I usually will check it on the Internet first, or ask my classmates around me, then I will go ask my instructor (Interview, Su Shan).</p> <p>Sometimes I would check these problems online (Interview, Zhao Chao).</p>	Though some students indicated that they would seek help from instructors or peers, the priority is always from the Internet. Students found it more approachable to obtain answers from the Internet than asking questions to other people. This could be explained by the affordances of the Internet and personal devices.
Peer Learning	Students reflected on some collaboration and dialogue with peers that help them comprehend learning materials and gain deeper insights ($M=4.27$, $SD=1.61$).	<p>We all have chat groups on our mobile phones. We ask all the questions there when we post tasks or if there are any questions (Interview, Liu Zhen).</p> <p>We can see the interaction with other students and other students' answers (Interview, Lu Yu).</p> <p>I do not think there is much relevance for Rain Classroom with communications between students since we barely used Rain Classroom for our group assignments (Interview, Shang Jia).</p>	Students confirmed that both Rain classroom and other social media allowed them to communicate with peers from other departments. Additionally, students reflected on some peer learning experiences through social media on personal devices. They also revealed that they did not have many collaborative programs to work on in groups.

In relation to the other scales, Intrinsic Goal Orientation, Effort Regulation, and Peer Learning, some students in the interviews confirmed that the mobile-assisted learning activities increased their interest, regulated learning, and the opportunities for peer support. However, comments from the interviews also revealed that some of the students' intrinsic motivation did not change significantly compared with their previous learning experiences that did not involve mobile support. Instant messages and notifications on cellphones might cause extra disturbance for learners. Though students sought peer support in group chats, they were seldom involved in group assignments or collaborative programs.

Students' Sharing About Engagement Through Visual and Interviews

This section displays participant-produced photographs that represent engaging learning moments and activities, expecting to present an intuitive picture of how students were engaged in mobile learning. Subsequently, students' verbal descriptions of those photographs in personal interviews are analyzed, explicitly further explaining the themes generated from photographs and expanded on student perceptions of mobile learning. The integration of photographs and personal interviews contribute to a comprehensive understanding of students' engagement, thus generating answers to the second research question about students' lived experiences.

Engagement Shared through Photographs

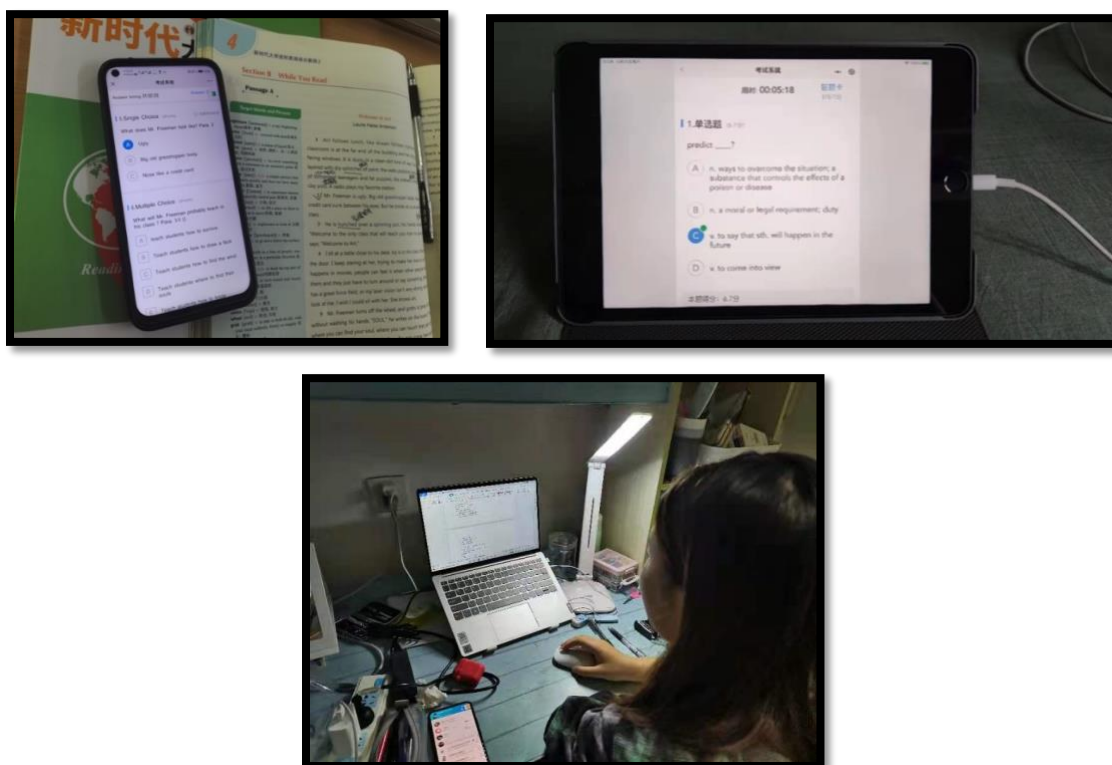
Through this visual production method, photographs were gathered to uncover students' lived experiences of engagement when they used mobile learning activities for English Learning. The photographs submitted by students provided direct answers to how students were engaged and what they were doing. According to the content, those photographs were categorized into the following three types: (a) cellphones for seamless learning, (b) activities for exchanging information and completing assignments, and (c) independent learning activities tailored to personal needs.

Cellphones for Seamless Learning

This category of photographs explored how students used mobile devices for seamless English learning activities by presenting students' learning status in multiple locations and revealing various during- and after-class learning moments. As presented in the photographs, most of the learning devices being used by students were cellphones (appeared in 33 photographs) while other devices, such as tablets (in two photographs) and a laptop (in one photograph), also appeared in several photographs. Figure 11 shows examples of the devices used in those photographs. It is evident that most of the students chose cellphones as the device for various types of learning.

Figure 1

Examples of Devices for English Learning



Note. The photos depict how students use mobile devices while learning English. Top left is a photo of a smartphone being used while the student is also using a textbook and a pen for learning. Top right is a photo of an iPad being used for a linguistic test. In the bottom photo, a student was switching between a laptop and a smartphone while learning in her dorm.

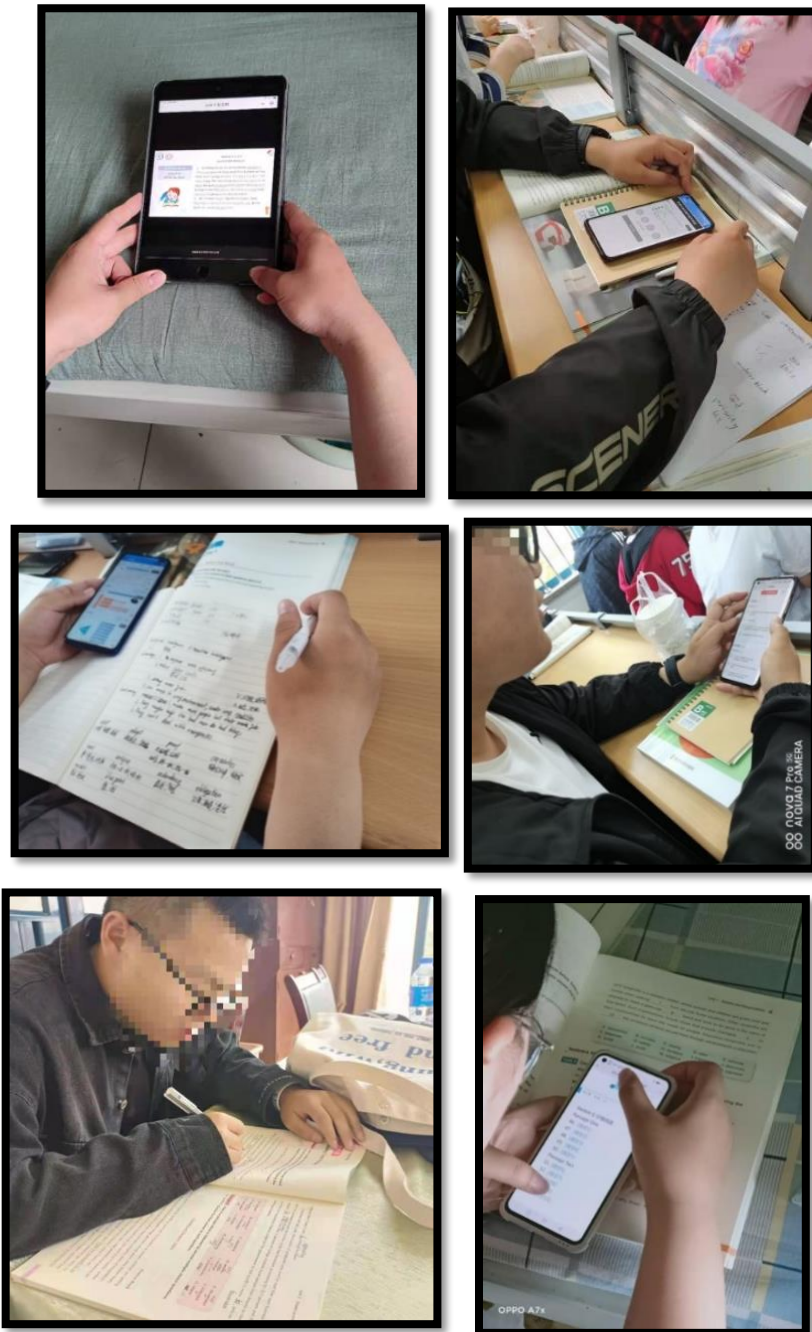
In terms of students' status of using mobile devices for learning, students were engaging in a variety of activities in different locations. For instance, students read materials provided by their instructor, completed exercises or tests, and jotted down notes while referring to the materials on Rain Classroom (see Figure 12 for examples). The photographs also displayed various locations of mobile learning. Some of the learning moments happened during the College English lecture while some of them were beyond the classroom, in a study room of a library or in students' dorms.

Those photographs demonstrate that students used mobile devices mainly for the two learning situations: a hybrid learning context (e.g., receive instructional resources during the lecture) and an independent learning context (e.g., completing tests in any locations during their spare time). In these learning situations, students obtained access to extracurricular resources and submitted answers through personal devices, showcasing their interaction with the learning content and a seamless learning opportunity and allowing students' control and flexibility of what to learn, when to learn, and where to learn.

The group of photographs presented in Figure 12 show moments of students' involvement in hybrid and independent contexts when students were involved in mobile learning, encompassing a variety of learning processes, such as reading learning materials, practicing language skills, and jotting down notes from their cellphones. Their learning locations also varied according to the pictures, such as in the College English lecture hall, in the library, and in their dorms. From those photographs, it can be concluded that mobile learning granted students the flexibility of choosing materials, study time, and study locations.

Figure 2

Examples of Moments of Students' Involvement in Mobile Learning Activities



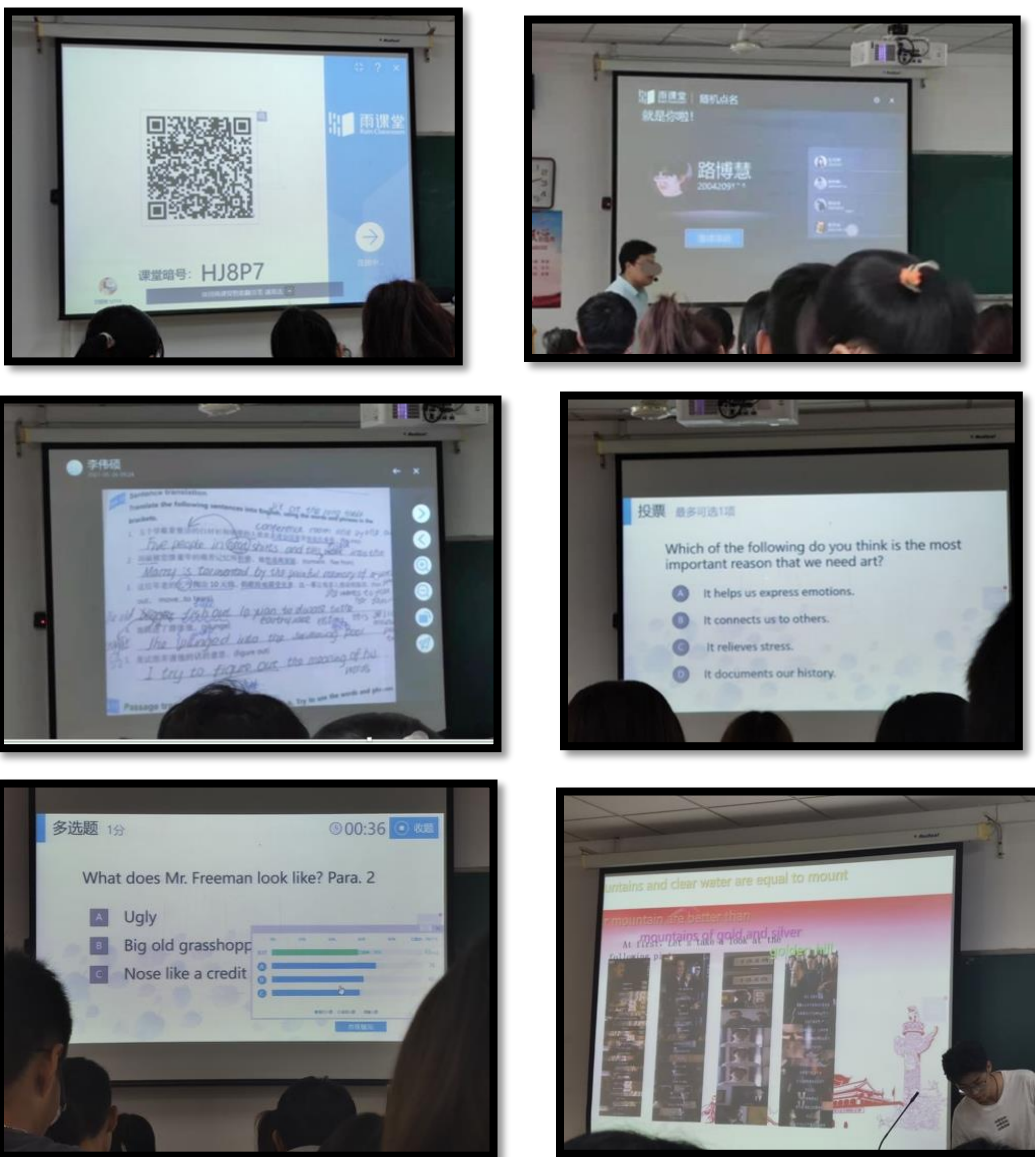
Note. Top left is a photo of a student reading learning material on a tablet. Top right is a photo of a student completing a test on a cellphone. Middle left is a student jotting down notes while referring to PowerPoint slides on a cellphone. Middle right is a student doing exercise during the College English class. Bottom left is a student learning in a study room in a library. Bottom right is a student practicing English in her dorm.

Activities for Exchanging Information and Completing Assignments

One of the key themes generated from the content analysis of photographs was activities for exchanging language information and completing assignments. Students submitted 33 photographs of engaging in mobile activity content from College English lectures, in which students were required to pay attention and actively operate on their devices. Among those photographs, the majority of them (30 photographs) included PowerPoint slides showed by the instructor during the lecture. The activities from the PowerPoint slides mainly included the following types of activities: QR codes of logging into Rain Classroom, calling attendance, completing exercises (multiple choices of reading comprehension, filling in blanks, and paragraph translation) that required submissions from cellphones, results of students' submissions (statistical results of multiple choices, students' hand notes, and compositions), and bullet screens (a type of live message appearing on the top of the screen).

Rather than simply listening to the lecture for passive learning and obtaining limited opportunities of practicing English, students are required to pay attention to the instructions and actively operate from their devices for completing assignments. Specifically, students used their cellphone cameras to scan the QR code so that they could log into Rain Classroom; once students logged in, the instructor randomly picked up names from the class roster for answering questions; students submitted answers to exercises through Rain Classroom and the results could be displayed to all students; students sent bullet screens that can be presented on the PowerPoint screens. Figure 13 shows mobile activities displayed on PowerPoint slides that students found engaging.

Figure 3

Engaging in Mobile Activities on PowerPoint

Note. Top left is a QR code for logging into Rain Classroom. Top right is the instructor using Rain Classroom to call attendance. Middle left is a display of a students' translation answers. Middle right is a multiple-choice exercise that requires students' reply on their devices. Bottom left is a statistical result of students' multiple-choice answers. Bottom right is a PowerPoint slide with bullet screens.

Besides those photographs about PowerPoint slides, students also took several screen shots from their devices about the exercises that required students' input of answers, thus

establishing active engagement in activities. For instance, the screen shot shown left in Figure 14 is a status of a student's cellphone screen when she was scanning PowerPoint slides on her device. She also input the bullet screen of "mandate" that appeared on the left bottom of the photograph. The screen shot shown right in Figure 14 was a filling-blanks question displayed on students' side. The screen shot shown in Figure 15 is a list of all the screen-shot messages that students reviewed from their devices. It could be interpreted that students were more interested in learning activities that allowed their sharing of information; mobile learning enabled this type of learning and made it easily approachable through inputting information from personal devices.

Figure 4

Engaging Mobile Activities Displayed on Cellphones



Note. On the left is a screen shot of PowerPoint slides and bullet screen on a student's cellphone. On the right is a screen shot of students' answers to a fill-in-the-blanks question.

Figure 5*A List of Bullet Screens*

Note. This is a list of bullet screens sent by students and displayed by the instructor.

The photographs in this category identified mobile activities achieved through Rain Classroom that students perceived engaging in College English classes. The PowerPoint slides displayed by the instructor and the screenshots on personal devices represented major features on Rain Classroom as captured in those photographs, such as completing exercises, presenting submission results, and bullet screens. Thus, it is concluded that mobile learning activities allowed opportunities for students' output of language and information exchange, which were regarded as engaging learning content.

Independent Learning Activities Tailored to Personal Needs

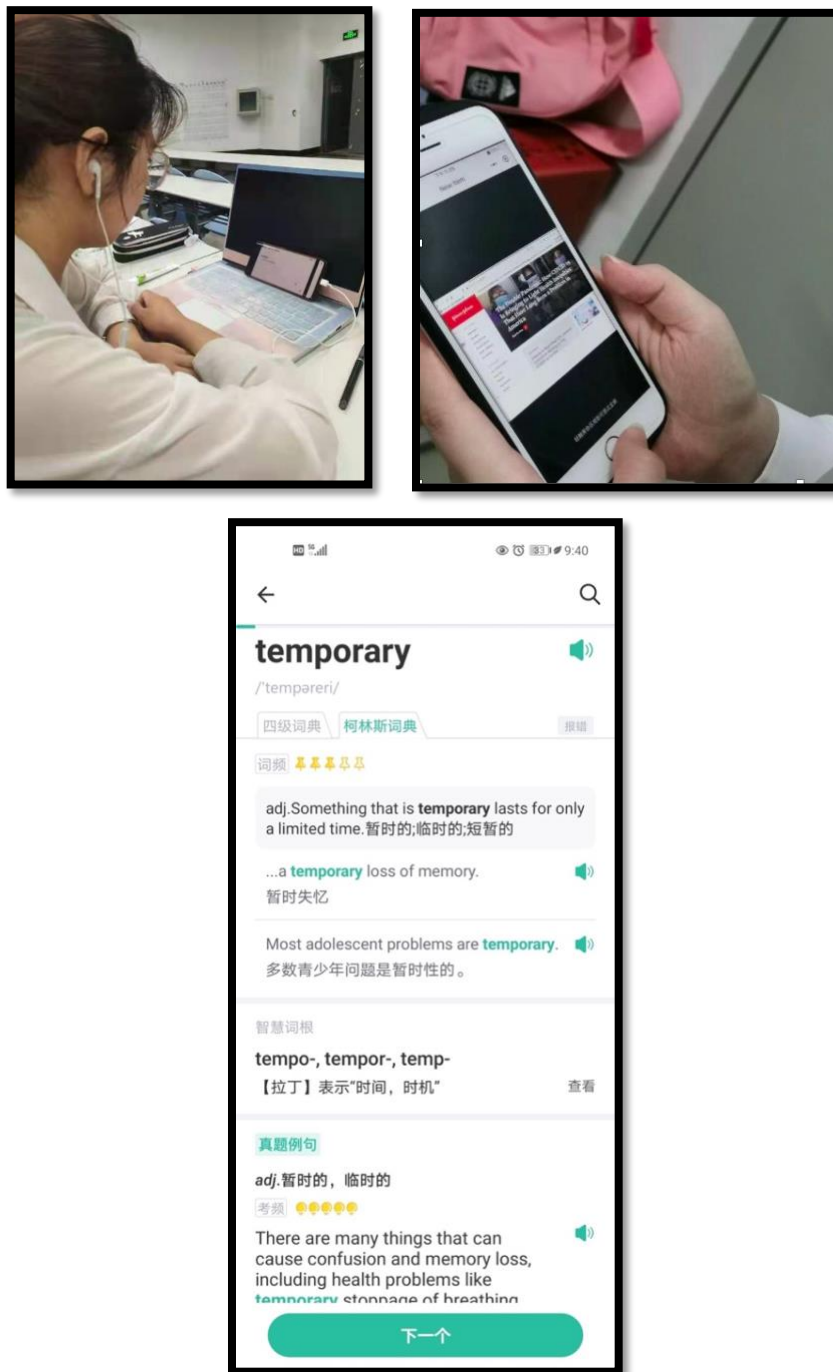
In addition to the two categories presented above, students also displayed photographs of personal use of mobile learning activities that are tailored to individual needs for mainly three types of learning content: examination-orientated strategies, personal interests, and general English learning support. Students presented some images when they were learning from an app

that contained reading and listening strategies of CET. In some other photographs, students used cellphones to practise English pronunciation and watch English movies. Those activities did not have direct connections with CET, which does not involve oral tests, but were more relevant to their personal interests. Besides, there are also some photographs in which students were seeking translation help, reading learning materials, and looking up vocabularies in the dictionary, which were general English learning activities and might be related to both examination-orientated strategies and personal interests of English learning. Photograph examples of each type of learning content are presented in Figure 16. Though carrying varying content in the photographs, those learning activities served similar purposes: to extend students' learning opportunities beyond the textbook, cater to individuals' needs, and elevate the potentials of language acquisition.

In all, for this photo-production phase in the qualitative data collection procedure, students provided 71 photographs, consisting of three major categories of student engagement in and out College English classrooms: (a) cellphones for seamless learning, (b) activities for exchanging information and completing assignments, and (c) independent learning activities tailored to personal needs. For the first category of photographs, students were mostly involved in learning through cellphones for diverse activities. Those engaging moments occurred in several locations, including the College English lecture hall, a study room of a library, and student dorms, showcasing a seamless learning condition through mobile devices. For engaging mobile activity content in the lectures, students' photographs primarily presented intriguing features that were carried on Rain Classrooms, such as the way of logging into the app, calling attendance, completing exercises via mobile devices, results of students' submissions, and bullet screens, which required students' attention, active participation, language output, and knowledge exchange.

Figure 6

Examples of Personal Use of Mobile Learning Activities



Note. Top left is a student listening to materials about CET on her cellphone. Top right is a student reading an English version of news about COVID on her cellphone. The bottom image is a screenshot of the explanation of a vocabulary.

In the end, photographs of students' personal use of mobile devices mainly introduced mobile activities for examination-oriented learning, personal-interest learning, and general English learning support, which could expand English skills beyond the knowledge obtained from the College English course.

Student Descriptions of Engagement From Personal Interviews

In this section, data collected from personal interviews were analyzed and generated into three themes—cellphones as the major learning devices; a support for inquiry between students and the instructor; and more possibilities for independent learning—that confirmed the findings in the photographs. Furthermore, another three themes—elevated learning efficiency; learning for higher grades; and drawbacks of mobile learning—were categorized to contribute to a more comprehensive understanding of their lived learning experiences.

Cellphones as the Major Learning Devices for Seamless Learning

Consistent with the findings from the photographs, students' primary choice of English learning devices was cellphones. Students articulated the reasons for high frequency of using cellphones for learning are the portability and the convenience of logging into the learning platform of Rain Classroom. According to students' descriptions, not all students had a laptop, but they all possessed a cellphone for daily use. Students explained that compared with laptops, cellphones were lighter to carry and could extend learning beyond a specific location (e.g., in the classroom, in their dorms, or in a café), contributing to learning “on the go.” The extra cost of a laptop may be another reason for many students who choose to use the devices they already possessed for learning.

Cellphones are particularly user-friendly because students used the camera on cellphones to scan quick response (QR) codes as simple access to Rain Classroom without

spending extra time finding websites on laptops. This also explains why most of the students (98.54%) chose cellphones as their primary device for college English learning in the questionnaire. Figure 17 includes a QR code that was generated by the instructor on Rain Classroom for students to scan for logging in. Students could also input the code of MYYKP on the platform using other devices they preferred. Only two students talked about their experiences of using devices other than cellphones. One student who was interviewed said she used a tablet when reading PowerPoint slides or taking exams because of its bigger screen. Another student used her laptop to make notes of new vocabularies she learned on an app during her spare time.

Figure 7

Students Logging Into Rain Classroom by Scanning a QR Code

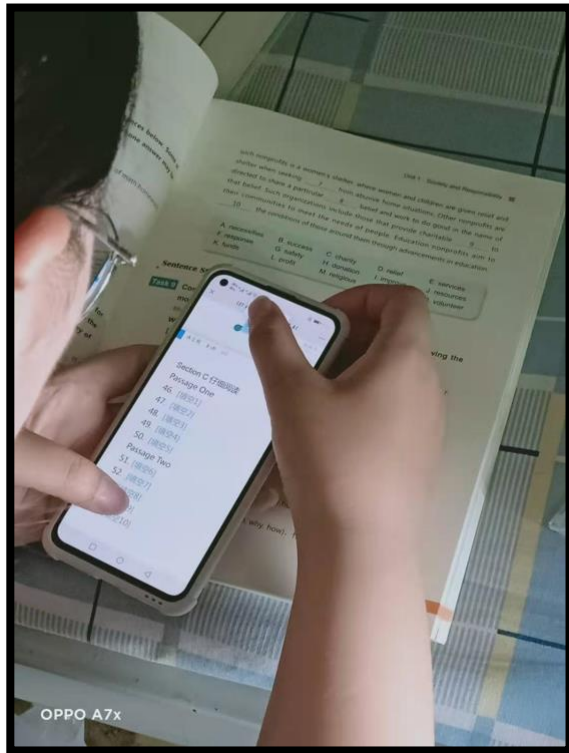


The high proportion of cellphones among students created the pre-request of making use of mobile devices and apps for learning. Rain Classroom, the major app used for lectures, was loaded in WeChat, one of the most popular social media on cellphones in China, meaning that students do not have to download additional apps for logging into it. Because of its availability and unrestricted access to all users on cellphones, students found it easy to log in and view lecture resources. Most interestingly, PowerPoint slides can be presented on students' cellphones synchronously, meaning that students can view the slides either on the projector screen or on their cellphones, either following the instructor's pace or at learners' pace. As such, several students have emphasized the ease of accessing Rain Classroom through their cellphones. For instance, one student commented on the access to Rain Classroom through her personal device: "The mobile terminal is also very convenient. It is a WeChat mini program, while basically everyone has a WeChat account, it is also very convenient" (Interview, Li Su).

Several students highlighted the flexibility of time and location as an important feature of learning on cellphones. They compared viewing learning materials and doing exercises distributed by the instructor on Rain Classroom and traditional ways of completing those activities and showed preferences of taking the comfort of own devices. For instance, instead of viewing PowerPoint slides during the lecture, students could view the content on their cellphones by logging into Rain Classroom from any places where they preferred to study. Similar with completing quizzes during a lecture in a traditional class setting, students finished quizzes before the deadline at the convenience of their schedules. Figure 18 shows a student doing a quiz on reading comprehension on her cellphone in the dorm.

Figure 8

A Student Doing a Quiz in the Dorm



Two students also made comments on doing activities on cellphones in the following two interview conversations:

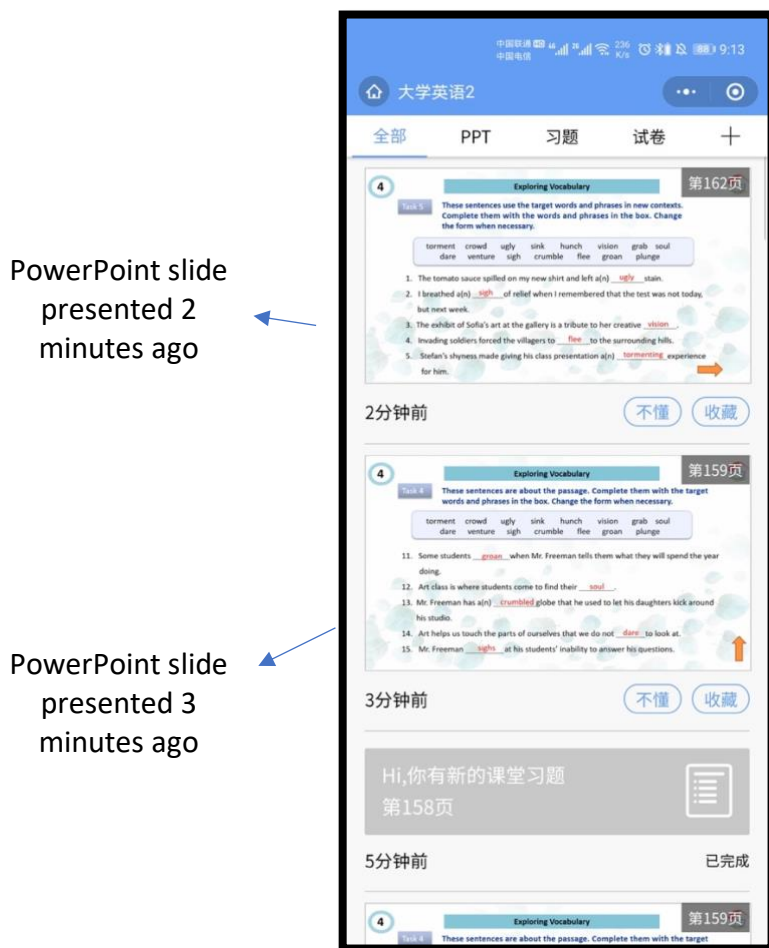
I think it's very convenient to use Rain Classroom. Whether it is PowerPoint slides or test papers, there is not much limit compared with [learning using] a textbook. It doesn't have to be in a set place or time. (Interview, Liu Zhen)

Sometimes the test papers assigned in class contain many questions and can only be completed after class since it takes time. If it is to be done in class, it will affect the progress of the course. So, we usually prefer to do them according to our schedule. (Interview, Shan Shan)

Another vital feature mentioned by students was for those who were short-sighted. Because the College English lecture was given in a lecture hall with more than 100 students, those who sit in the back of the classroom always have difficulties seeing the content on the screen. One student mentioned how the problem of short-sightedness might bother them: “Since the classroom is relatively big, some students at the back row might not be able to read the blackboard or the questions clearly” (Interview, Liu Zhen). However, students could watch live PowerPoint slides on cellphones whenever they wish. Figure 19 shows a student taking notes while watching the PowerPoint slides on his cellphone. Short-sighted students could follow the slides on their cellphones instead of staring at the project screen, making the learning content visible. A student who was short-sighted talked about his experiences of reading PowerPoint slides on his cellphone: “In fact, the lecture hall is very big. Sometimes we sit with our glasses on and still can't see clearly. But with Rain Classroom, I don't have any problem with what the instructor was presenting to us” (Interview, Wang Kai). Thus, live PowerPoint slides on cellphones have a significant meaning for short-sighted students.

Additionally, because of students' initiative to control live PowerPoint slides on their cellphones, students found the Rain Classroom helpful for keeping track of the instruction because they could read the live PowerPoint slides as the instructor switched pages and go back to previous slides for information that they might have missed. Those operations can be managed on their mobile devices without asking the instructor for assistance. As one student noted, “At least Rain Classroom will show you which side the instructor is talking about. If I get lost [about the instructional content], I can come back to the slide and try to figure out what the instructor is talking about” (Interview, Wang Kai).

Figure 9

Live PowerPoint Slides on a Cellphone

Therefore, the high proportion of cellphones among students not only represents the applicability of applying mobile learning in College English classes but also guarantees individuals' easy access to learning content. The ease of logging into the app, the flexibility of finishing tasks without time or location restrictions, and the convenience of reading live PowerPoint slides have contributed to students' choice of cellphones as the major learning device. Those features made the English learning process easily accessible, thus facilitating their active engagement.

A Support for Inquiry Between Students and Instructor

Students showed initiative in participating in the lecture and felt fully involved in the learning process because of the support for inquiry between students and instructor achieved through mobile devices. This theme is highly related to and explains the second photograph category: activities for exchanging information and completing assignments. As described by students, most of them highlighted the function of bullet screens and the submission of tasks on Rain Classroom for its mediation of inquiry between students and their instructor. Students also praised other ways of inquiry with the instructor, such as submitting photographs and other evidence of tasks, to help navigate the process of the lecture. Mobile learning enabled students who were shy to share ideas, particularly in a large class, to overcome psychological challenges and present ideas freely on the platform.

According to students' comments, they found bullet screens uniquely accessible for them to exchange thoughts, questions, and answers. Bullet screens are live conversations sent by students and displayed on the projector screen and students' cellphone screen when they use Rain Classroom. Distinguished from chats in traditional chat boxes that usually appear as a section on the left or right side of the screen, bullet screens fly like bullets on the top of screens and are embedded as part of the screen content. Figure 20 shows a photograph of bullet screens in different colours sent by students during the lecture. Those live messages moved from the right side of the screen to the left side, and messages from different students were set apart. Students were responding to a question by sending out their answers that were presented on the screen. In this form, bullet screens became more attractive to grab students' attention in the live chat. Meanwhile, the instructor would not miss any of the questions raised by students. Compared with the traditional class that does not involve mobile devices, they found this way of participating more relaxing without feeling embarrassed when answering questions.

Figure 20

Students Using Bullet Screens to Answer Questions



Some students particularly indicated their shy personality and were reluctant to speak in front of the whole class, which consists of more than 100 students. Instead of standing up to present personal opinions, they preferred to use typed comments or answers that could release stress and be less burdensome. Students described this way of interacting with the instructor as similar to using their phones to chat on social media with a friend “with a very peaceful mentality.” One student talked about her feeling when submitting bullets screens for interaction with the instructor as follows:

The bullet-screen function can easily shorten the distance between the instructor and us. Some students may feel nervous about standing up and answering questions, or sometimes they can't speak clearly. If they send a bullet screen instead, it is easy to reduce this nervous feeling and feel very normal. (Interview, Li Su)

Thus, students who were not confident in answering questions raised by the instructor could

settle this problem by submitting typed answers and get involved in the participation. Doing mobile activities helped them improve confidence and raise their class participation rate. In a positive cycle, with more participation in class, students felt more distinguished in their performance and were more willing to share thoughts in the English class.

Besides, because the bullet screens presented on the screen are anonymous, students were encouraged to make inquiries without hesitation. A lack of confidence when speaking a second or foreign language has been a critical problem for many university students. One student pointed out the feature of asking questions anonymously helped him overcome the difficulties of asking simple questions to the instructor because of his low language proficiency. He made clear his preference to use this type of inquiry compared to his learning experience in high school. From his comments, we could perceive that the feature of anonymous submission has been a breakthrough for learners who are reluctant to present opinions:

During high school, sometimes I was embarrassed to ask when I had problems in class. My English foundation is relatively weak. Since when I was young, I didn't learn it well. Sometimes I'm too embarrassed to ask some simple questions during the lecture. At this time, the advantages of mobile devices are reflected. I can simply ask the instructor questions anonymously. (Interview, Jie Lun)

Several other students also agreed that this type of input boosted student–instructor communication, which otherwise could not be achieved at ease given the large number of students and the limited lecture time. The instructor enabled the bullet-screen feature during every lecture so that students used bullet screens to ask any questions or confirm ideas whenever they felt needed without disturbing the progress of the lecture. Some students commented in detail on the benefits of this type of inquiry between students and the instructor, including

enhanced interactivity, avoiding concerns of mistakes, and protecting self-esteem. For instance, students said that “we can raise our questions to the instructor or express our opinions any time, which enables students with a strong interactivity” (Interview, Zhao Chao) and “there are some questions that I really want to ask, but sometimes I don't want to ask due to my self-esteem, then I will go for sending bullet screens” (Interview, Liu Zhen). Another student explained how bullet screens overcame her difficulty of presenting answers without considering them right or wrong:

I can freely express some of my own speech by sending bullet screens. I am also somewhat introverted. I am also a little more easy-going on the bullet screen. It's just what I want, and I don't feel embarrassed if I get the wrong answer. (Interview, Shan Shan)

Students were less likely to be distracted in the class because of the frequent inquiry with their instructor, who utilized it to test students' attention paid to the lecture. The instructor posted questions for students to reply which could be recorded as students' participation, therefore, monitoring students' involvement. In the long term, students found it helpful to keep them concentrating. One student described how that worked to increase their participation:

The instructor will ask some questions in class, and sometimes he used them to check if someone is distracted. For example, he will ask us to choose the correct answer for the reading content for one or half a minute. Actually, when the instructor was giving a lecture, he told us the answer directly but simply wanted to test who did not listen to him.

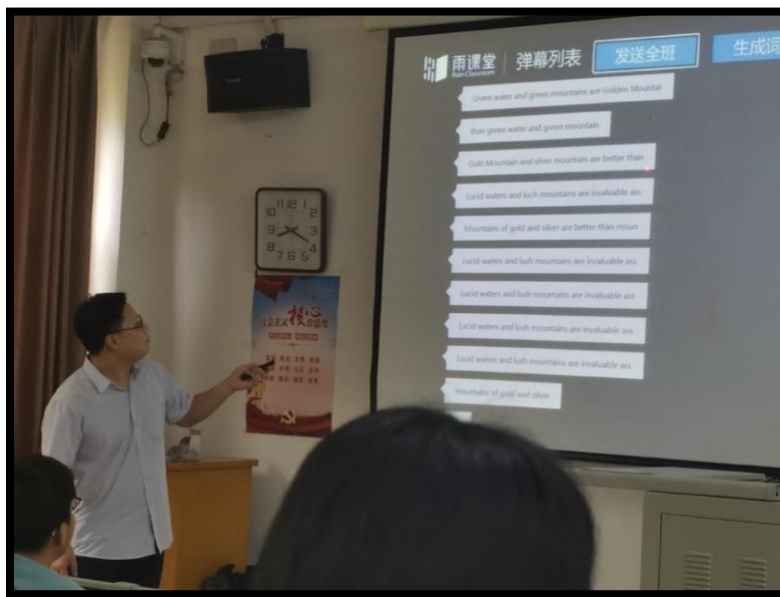
This can reveal who has focused on the class and who has not. (Interview, Jie Lun)

Bullet screens also facilitated the communication between students and their instructor, supporting the bilateral expressions of thoughts. As soon as the instructor noticed a question in bullet screens, the instructor could respond to it instantly without any delay. The instructor could

read the live comments or questions raised from the students' side and present a list of all the bullet screens students sent in case they were ignored unintentionally. Figure 21 shows an instance when the instructor used a controller to roll the list of messages from students so that he could scan all the questions and provide a more specific explanation to certain ones.

Figure 21

Instructor Showing all Bullets Screens Sent by Students



From the interviews, students confirmed that sending out answers helped navigate the instructor's instruction towards the questions that students had problems with. One of the students described how bullet screens led directions of teaching during the lecture:

When the instructor was teaching using Rain Classroom, he asked us to cast those words or a sentence from the textbook that we felt unsure about on the screen so that he made sure which [word or sentence] was difficult and then provided more explanations.

(Interview, Liu Zhen)

One student mentioned the way of inquiry beyond sending bullet screens. Rain Classroom also allowed students to submit photographs of their notes so that the instructor could monitor the accuracy of the notes and may also provide verbal feedback for correction. The student's comments on submitting notes are as follows:

You can ... take photos of the content of your notes and submit them to the instructor.

The instructor can also see it. After the instructor receives your submission, he can directly read it, similar to presenting PowerPoint slides, and everyone can see it.

(Interview, Li Su)

Thus, from students' descriptions, the inquiry between students and their instructor was boosted through their engagement in sending bullet screens and other evidence of assignments. The student-instructor interactions displayed in this section were mediated by the tool of mobile devices, elevating students' willingness to communicate, boosting instant conversations between them, granting more opportunities of receiving feedback from the instructor, and allowing higher potentials for knowledge acquisition.

Rain Classroom provides a safe space for students, especially those who are shy or unconfident to express thoughts and opinions without much concern. This could not be achieved at ease without a mobile-assisted approach at hand for students to make use of. Though some students participated in the inquiry with their instructor because of participation records, most of them found it meaningful to check their comprehension of the learning content through this method. Therefore, mobile learning activities enabled inquiries between students and their instructor, maintaining students' involvement in activities and their attention to the lecture.

More Possibilities for Independent Learning

As discussed in the findings of photographs section, students were engaged in independent learning activities tailored to personal needs; students elaborated in the interviews

that mobile learning provided them with more options to support independent learning. According to students' opinions, Rain Classroom was not only used during the lecture time but also as a platform where they could preview and review the learning materials. In traditional College English classes, students relied on the teaching content delivered by the instructor during the lecture. Differently, in this hybrid learning environment, the instructor posted learning materials and PowerPoint slides ahead of time, the notification of which on Rain Classroom could be sent to students' cellphones directly to encourage students' independent learning. For instance, when the instructor posted learning materials on Rain Classroom, students could get a message reminding them of the new content, enabling them to scan the materials and mark where they were unclear on the slides.

Students maintained their interest and independently previewed learning materials prior to lectures though they were not required to do so. The notifications on cellphones always reminded them to solidify English skills. One student illustrated how meaningful this function was since it had changed the way how he treated previews. He stated that "I always want to read the notifications in Rain Classroom. I want to read it when he sends it out. If he doesn't send it out, I definitely don't want to read it" (Interview, Wang Kai). Another student also highlighted how she had more initiative to complete previewing: "The coursework assigned by the instructor and the PowerPoint slides for the lesson were easily visible in the app so that we could review the previous study material with ease" (Interview, Su Shan). A significant change in independent learning also appeared in several other students' interviews. For instance,

Our instructor distributes the courseware in advance for us to preview. And sometimes we will be assigned some questions. Under the distributed courseware, we could post comments on what we don't understand. The instructor will focus on some of these areas in class. ...

When I was in high school, I didn't really like previewing, so I didn't always preview. Now through this format, I expect to be more active in learning (Interview, Bai Fang).

The instructor will post [PowerPoint slides and other materials] in advance. For example, if he wants to talk about Unit 5, he sends you the text of Unit 5 and exercises that allow you to preview, and you know how many seconds you need to spend on each exercise to complete the preview (Interview, Wang Kai).

With the option of previewing the new chapter through answering questions related to it, students found themselves more guided through the chapter by making sense of the topic, critical vocabularies, and the thesis of the texts. In the interviews, one of the students showcased the meaning of previewing the questions sent to them before coming to the lecture.

You can find these questions in the text to help you understand the text. I think this is quite meaningful. You can understand what the chapter is about through these questions. Looking back and forth like this will help strengthen our impression. It is in the form of question and answer. (Interview, Wang Kai)

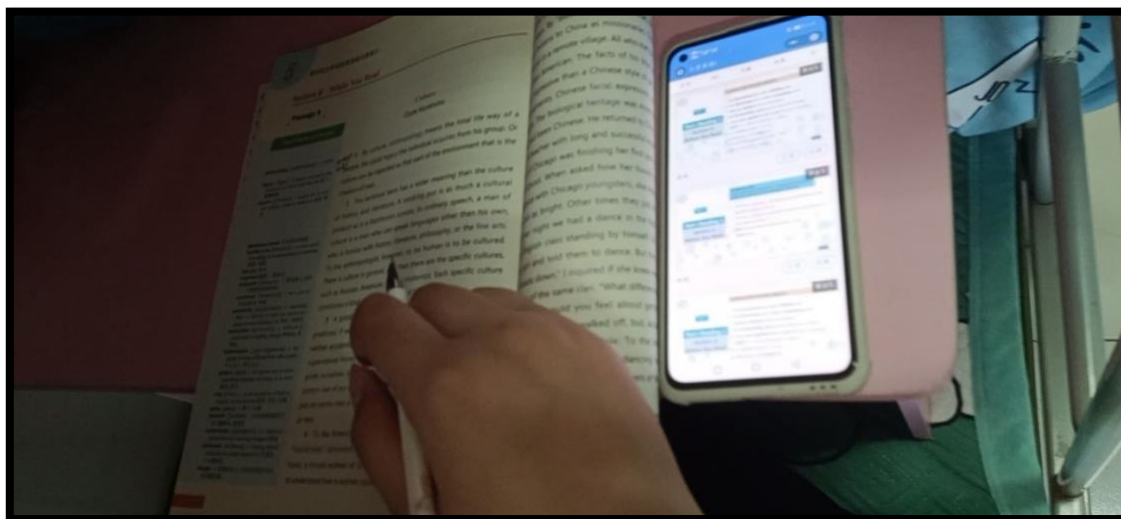
In addition to previewing learning materials, several students pointed out in their interviews that Rain Classroom worked as a platform for them to review learning materials autonomously. The photograph presented in Figure 22 shows a student referring to PowerPoint slides when reviewing the chapter content.

One student stated that in traditional lectures, instructors usually assign tasks verbally towards the end of the class. In that situation, students were concerned about leaving the classroom without paying enough attention to what the instructor assigned so that they missed or ignored important information. Although they might review the learning materials sometimes, they were not sure where the key points were. With Rain Classroom, reviewing was changed.

Students reviewed learning materials and assignments on their devices so that they would obtain a basic understanding to the content and resolve any confusions if any.

Figure 22

A Student Reviewing PowerPoint Slides



Beyond working on Rain Classroom during the lecture, students found it helpful and enjoyable to use some English apps tailored to their personal needs for independent learning. Students used other apps besides Rain Classroom for a variety of linguistic gains. Most of them used popular vocabulary learning apps, such as Baicizhan and Youdao Dictionary. Following the suggestions from their instructor, they also utilized other apps that carry valuable resources for oral communication, listening skills, reading skills, and some other materials related to CET4. Table 7 lists the apps used by students and the major features that students found supportive.

Table 7*Personal Use Apps and Features*

Features	Apps
Vocabulary	Baicizhan; Baidu Translator; Lighthouse Reading; Memorize Vocabulary; Netease Cloud Dictionary; Iyuba; Shanbay; Yidian English
Translation	Baidu Translator
Video	Bilibili; Iyuba; Wumii; Yidian English
Listening	Daily English Listening; Keke English; Wumii
Reading	Daily English Listening; Lighthouse Reading
Pronunciation	Iyuba; Yidian English

Students chose apps according to their proficiency levels and personal interests, contributing to their development of English skills. Those apps provided students with rich resources that were not distributed during the lecture time, extending the opportunities of English learning and applications of English skills beyond classrooms. For instance, students used some apps to read English news and learn about cultures and rituals, by which they sought a way to connect to the world, discovered the usefulness of another language, and increased interests toward exploring the unknown. Students expressed their interest in using personalized apps for learning English in some of the interviews. For instance, “I think it’s very good. I learned a lot. I learned some things that the instructor didn’t say in class” (Interview, Lu Yu), and “I’m quite happy to listen to English songs, and I also want to watch some foreign movies after class” (Interview, Shan Shan).

As introduced by students, they chose apps for independent learning based on their personal needs. Most of them indicated that they used apps mainly to improve vocabulary,

elevate oral communication skills, and get training for passing CET-4. They found the apps designed for different functions and picked the most relevant ones for their English learning purposes. For instance, several students chose apps, such as Lighthouse Reading and Baicizhan, to learn vocabulary and kept using them consistently. They also explained that they maintained working on those apps due to the interesting designs.

When we learn English by using apps, we always utilize the vocabulary memorizing app called Baicizhan. In the app, it does not only show standard definitions and example sentences when explaining the word, but also vividly explains the meaning of the word or phrase by way of pictures for our easy comprehension. (Interview, Su Shan)

Another student indicated that she used Lighthouse Reading for memorizing vocabulary because it records her daily use of this app and her progress:

For vocabularies, some software has the function of keeping daily attendance. Sometimes I do not want to break the consistency, so I keep taking attendance on it. ... You can have many things that you can see, and it is no longer the rigid ones. You have more sources of information. (Interview, Lu Yu)

One student who also used Lighthouse for vocabulary mentioned that the accumulating vocabulary on it contributed to improving other linguistic skills.

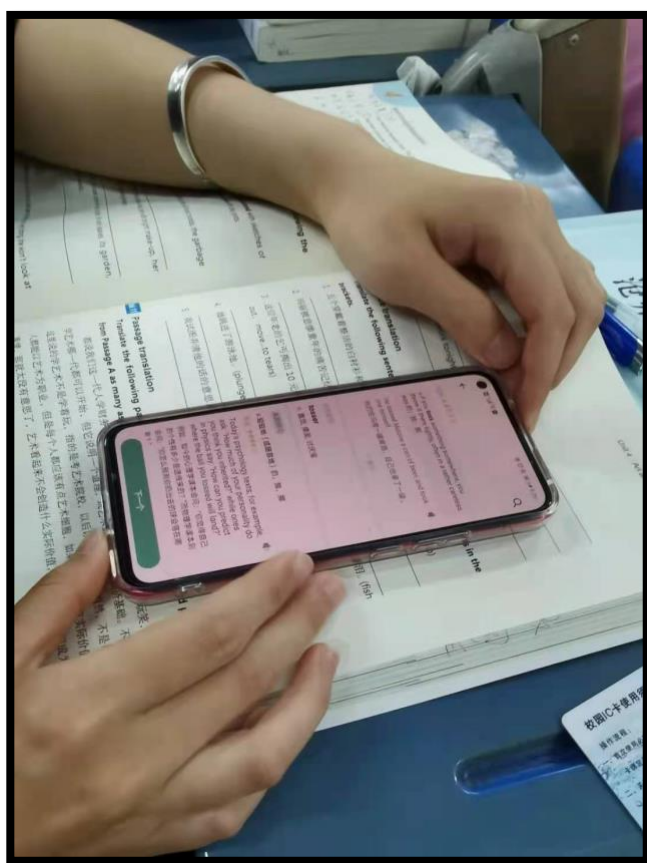
It [Lighthouse Reading app] enables me to enhance my vocabulary size, which is particularly essential for English learners. It is important to acquire a considerable amount of vocabulary first before you can understand English articles and improve English listening skills. (Interview, Shang Jia)

Figure 23 shows a student using the app Shanbay to learn vocabulary while studying in the library. Learning new vocabulary on cellphones has been the priority for many students

through other resources such as vocabulary books or printed dictionaries. Those vocabulary apps load multiple types of resources, such as verbal, audio, and video assistance, which cannot be carried by traditional learning resources. Therefore, students perceived learning vocabulary on cellphones more entertaining and enjoyable.

Figure 23

A Student Using an App for Learning Vocabulary



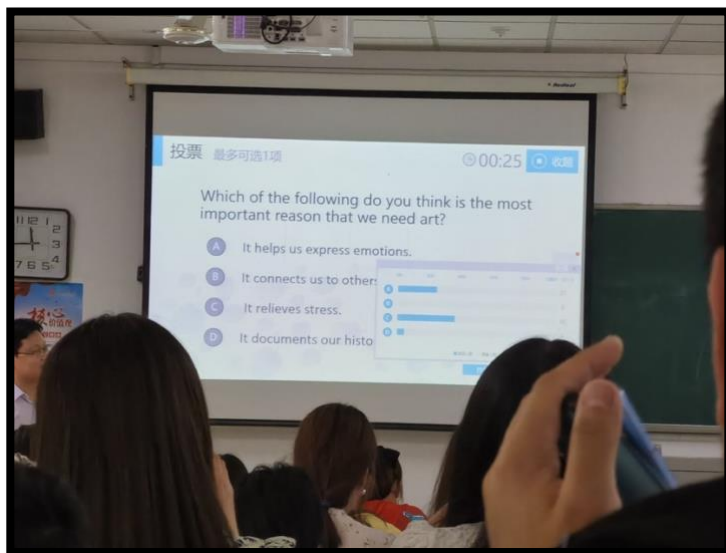
Thus, mobile learning enabled students to independently preview/review learning materials at ease and seek support from personal-used apps based on individuals' needs. In Rain Classroom, PowerPoint slides are not only visible on students' devices during the lecture but also easily accessible after class for references at students' convenience. A variety of apps, either

suggested by the instructor or discovered by students, carried different functions, introduced additional language skills or supported an emersion in a virtual English-speaking environment. Students' initiatives for independent learning—previewing/reviewing and acquiring English skills through other apps were significantly elevated.

Elevated Learning Efficiency

The use of mobile devices facilitated students' learning efficiency through collecting test and exercise answers, presenting quick reports of the answers, and navigating instructors' instant feedback. As shown above, students used bullets screens to answer the instructor's questions. Students also indicated that the use of bullet screens enhanced their learning efficiency because a number of students could input messages simultaneously, and they received instant feedback from the instructor. Students no longer needed to wait for their turns to ask questions. Specifically, one student highlighted students' simultaneous input that enabled multi-sided interactions. She stated that “it will not be like answering a question by raising hands because some students will not dare to raise their hands. If we send bullet screens, everyone can send it at the same time” (Interview, Lu Yu).

Students finished tests on Rain Classroom so that the instructor could monitor students' linguistic skills and comprehension of the content immediately. For instance, students could choose multiple-choice answers and submit their notes or compositions. Answers to multiple choices submitted on the platform can be converted to statistics. In Figure 24 a statistical result of a multiple-choice question was presented on the right bottom of the screen, showing the percentage of students who made each choice. Compared with traditional classes where instructors use handout tests and mark the tests after class, instructors in this hybrid learning environment could provide instant feedback based on students' answers, thus facilitating learning efficiency.

Figure 10*Statistical Results of Multiple-Choice Answers*

Several students emphasized the feature of taking quizzes on Rain Classroom during the lecture for the ease of comparing their language proficiency with their peers. Students could not only view their own scores on personal devices but also compare their score to the average score and see their ranking among all the students. Several students have highlighted this feature in the interviews. Their comments in regard to this feature are as follows:

I could understand my level comparing to the class. ... After the class report, there will be an average score of the class as a whole and your score, as well as the total number of classmates and your ranking in between. (Interview, Shang Jia)

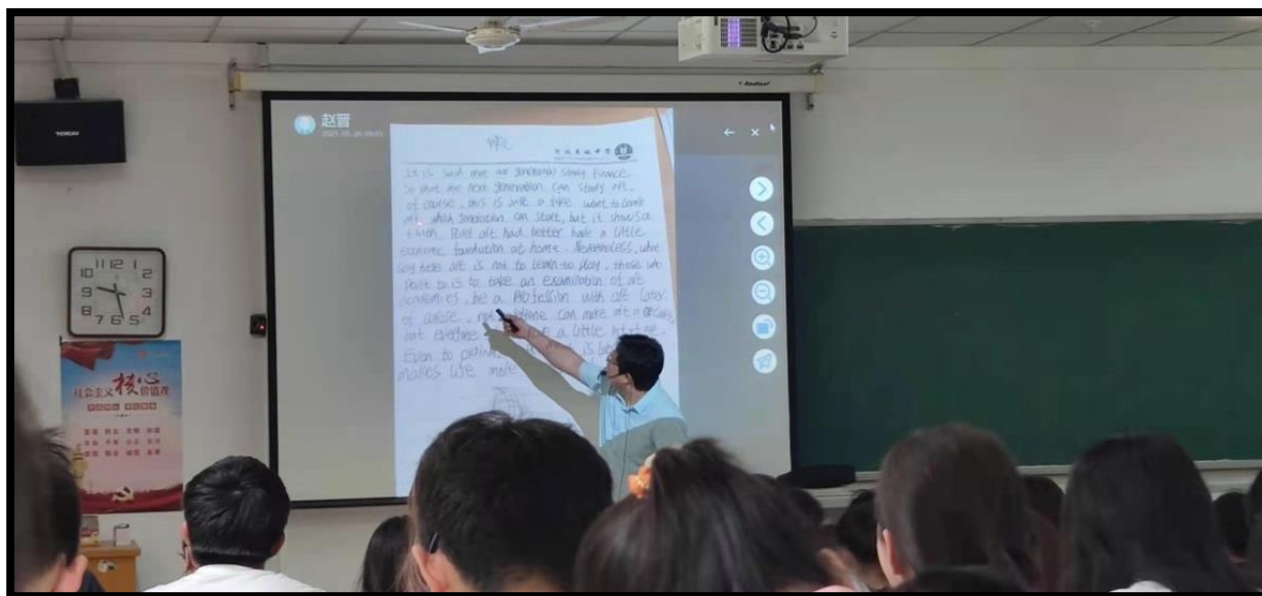
Your class average score will be released, that is, what is the average class score of this class, and how is your score, and it is processed like this. (Interview, Wang Kai)

An improvement in learning efficiency also was showcased in students' submissions of other assignments, such as translation tasks and compositions. Students submitted photographs of short-written paragraphs completed in class. The instructor could randomly choose several of

them from the submissions and display them to the class. Meanwhile, the instructor provided comments on sentence structures and the usage of vocabulary (see Figure 25). The whole submission and feedback process happened within a short time during the lecture with learning efficiency guaranteed. When reading others' submissions, students could also make comparisons with other classmates and thus consider their weaknesses for improvement. One student commented on submitting compositions during a lecture by saying that “I feel like I can submit my own thing and see what others have so that I can make a comparison and find the good points” (Interview, Zhao Chao).

Figure 11

Instructor Giving Feedback on a Composition



The benefits of efficiently working on Rain Classroom also appeared when students completed translation tasks. After students submitted their answers to a translation task, a correct answer will appear on their screen for their references and comparison. Thus, students could

compare their submission with the correct one word by word. One student indicated that this way of translation was superior to doing it in the textbook.

After the instructor finishes the lecture, he will show the translation [on Rain Classroom], by which we will make a comparison. It is difficult to apply this [comparison] to the books. Anyway, I will only make the comparison in Rain Classroom. (Interview, Wang Kai)

Students' narratives, in combination with the illustration of photographs, showcased how learning efficiency was boosted through the digital platform on students' personal devices. Not limited to collecting students' answers, Rain Classroom carries the functions of presenting submitted assignments and statistical results, enabling student–student and student–instructor information exchanges in a timely manner. Students compared and contrasted answers from peers to acknowledge their weaknesses and learn from more knowledgeable peers. The instructor provided corrective feedback according to the instantly collected submission, expecting to elevate students' proficiency through problem solving.

Learning for Higher Grades

Some of the students indicated that their primary learning motivation towards English was to obtain higher grades in examinations, such as final examinations and CET-4. Mobile-assisted learning during the lecture and after-class practices enabled this initiative. Students became more ambitious and challenged when using Rain Classroom because they could compare their scores of a test with the average score of the whole class and get participation scores based on their bullet-screen comments. One of the students indicated the relationship between her participation in Rain Classroom and her final score as follows:

The instructor can give you a Like on your bullet-screen comments, which can be seen in the system. At the end of the semester, your class performance rate will be slightly higher

than others'. Since you have quick, good answers, the instructor can give you a Like, which is also a motivator. (Interview, Li Su)

Another student showcased how her competitiveness was elevated through participating in the in-class and after-class exercises. Since the instructor gave extra participation scores if students gave answers to in-class exercises, students were motivated to pay attention to and participate in the learning. The class participation score for exercises in Rain Classroom represented her participation status. Students could see the score in this lesson and refer that to the average class score for comparison. Figure 26 is an example of a student completing an in-class exercise that was used for participation scores.

Figure 26

A Student Completing an Exercise for Participation Scores



In traditional classrooms, the final exam determines students' grades in this course. The instructor rarely used methods to record students' everyday participation. Students felt overwhelmed and highly anxious by the final exam. In this hybrid class, if students participated in those daily practices, they could accumulate participation scores, thus relieving the burden for the final grade. One student reflected on his experience of submitting a writing task by stating

that “I think it [my writing score] is pretty good, because it is linked to the final grading, so if I get a better score here, it will be easier for me at the end of the semester” (Interview, Wang Kai). Therefore, daily practices on Rain Classroom could reflect students’ participation, thus helping students accumulate scores for the final grade and relieving students’ anxiety and stress for the final exam.

Besides the final exam, students also got support for CET-4 through doing practices distributed by the instructor. Without the mobile learning option, students could only work on CET-4 on their own because the instructor could not spare time during the lecture to distribute printed materials to students, collect answers, mark them, and hand them back to students. However, with mobile devices at hand, students could answer quick questions about CET-4 through Rain Classroom followed by the instructor’s instant feedback according to the answers. The questions can be of various types, such as audio clips, reading paragraphs, translations, and a paragraph summarizing, which were of tremendous help for knowing the question types and strategies to give answers.

Rain Classroom accumulates students’ daily participation in College English classes. By converting students’ submissions into marks, the instructor allocated participation scores that became part of the final grade of this course, relieving students’ stress of the final exam. Support for CET-4 was also involved in the lectures where the instructor distributed CET-4 related questions and gave instruction on reading, listening, and writing skills. Given those benefits of learning English on Rain Classroom, students could enjoy the process of learning by participating in daily practices without becoming overly concerned with the final exams and CET-4.

Drawbacks of Mobile Learning

Students’ overall experience of Rain Classroom and other apps for learning English was positive. Yet, students also pointed out some drawbacks of mobile learning that negatively

affected their learning habits. The drawbacks were mainly embodied in the distraction from cellphone notifications while students learned independently and the small size of cellphone screens. Particularly, students found the notifications mostly from social media usually disturbed the consistency of learning on cellphones. Some students may choose to turn off notifications to avoid disturbance, while others may be paused during learning. Several students addressed the drawbacks of getting disturbed from learning, such as due to “incoming notifications,” as shown in the following conversations:

If we study via a mobile phone, it definitely can't eliminate a problem, which is to be distracted during the study, such as an incoming notification that can interrupt our study. (Interview, Su Shan)

I'm attracted to other things sometimes. I'll take a look at whatever notifications that QQ sends. It may be unavoidable that our attentions are sometimes distracted. I still rely on self-consciousness during class and turn off the message reminders. (Interview, Jie Lun)

It is easy to be disturbed when I learn on my mobile phone on my own. Some factors will affect it, such as a message from QQ, WeChat, or a text from your family, or any express delivery, and various entertainment information. You can't help but click to enter. By the time you leave the app, you just get distracted completely. (Interview, Shan Shan)

One student indicated her reluctance to answer questions (especially those requiring subjective input) on her phones because she found typing on cellphones was not as easy as writing on a textbook or a handout:

I think it's better to answer in textbooks or on paper. If I know the translation in the textbook, I will be more eager to write it when I look for the sentence that corresponds to the option. Sometimes I really don't want to write when I look at the phone. (Interview, Liu Zhen)

Another student raised similar complaints about learning experiences on the cellphone for the difficulty of reading a whole article given on the platform. She pointed out that the small screen of cellphones set barriers for her when she read. In the interview, she talked about why she would rather read printed materials instead of reading on cellphones by saying that “I think due to the mobile phone screen, some of the articles have poor continuity since I have to scroll back and forth all the time” (Interview, Zhao Chao).

Besides those issues of learning on mobile devices, one student also revealed some disadvantages of using bullet screens. Because bullet screens are displayed in a dynamic format, moving from the right side to the left, students might miss some of the messages. Though the instructor could display the whole list of messages, students might still lose the consistency of reading them.

Therefore, from students’ narratives, mobile learning activities could not avoid drawbacks, such as the distraction from cellphone notifications, small screen, and quick disappearance of bullet screens. The drawback of cellphone notifications was a major concern that caused interruptions as mentioned by several of the students. They either chose to ignore the interruption by strong self-regulation or had to pause during the learning process.

This section displayed findings from students’ narratives in interviews, coupled with illustrations of participant-generated photographs, constructing a complete picture of students’ lived experiences of their engagement in mobile learning activities. Taking place during the College English lecture or in students’ spare time, the experiences of mobile learning activities were categorized into six themes: cellphones as the major learning devices, a support for inquiry between students and the instructor, elevated learning efficiency, more possibilities of independent learning, learning for higher grades, and drawbacks of mobile learning. The analysis

of those themes depicted students' overall positive perceptions toward mobile support in the English learning process while retaining critiques about mobile learning activities.

Summary of the Findings

This chapter elaborated on findings from mixed methods of an online questionnaire, photographs, and personal interviews to address the research questions. For the first research question—to what degree are Chinese college students engaged in learning English as a foreign language, with the support of a mobile-learning platform—I presented a descriptive analysis of quantitative data to identify students' self-estimated engagement, including motivation scales and learning strategies scales, with most of the scales reported higher than average.

Subsequently, I integrated the quantitative statistics and the qualitative interviews and merged them into a joint table for comparison to seek a complete understanding of the influence of mobile learning activities on students' engagement. The qualitative inquiry confirmed most of the quantitative results and explained the reasons for students' choices, with some of the topics being expanded by various opinions from students.

For the second research question—What are undergraduate university students' lived experiences of engagement when they use mobile activities for English learning?—I categorized the photographs into three types according to the content: cellphones for seamless learning, activities for exchanging information and completing assignments, and independent learning activities tailored to personal needs. The first three themes—cellphones as the major learning devices, a support for inquiry between students and the instructor, and more possibilities of independent learning—generated from personal interviews confirmed and explained the photographs; the subsequent three themes—elevated learning efficiency, learning for higher grades, and drawbacks of mobile learning—from interviews expanded students' experiences of

engaging in mobile learning. Those findings exemplified how students were engaged and what they were engaged in while utilizing mobile devices for learning English.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

Researchers advocate seeking solutions for engaging students through technology, including mobile devices such as cellphone and tablets, are the priority to consider for portability and accessibility anytime and anywhere. However, because of cellphone stereotypes for daily connections and entertainment, some educators were reluctant to use cellphones for instruction. Rain Classroom and other apps have been employed as instructional tools in some studies, which demonstrated the usefulness and effectiveness of sharing information in learning communities and enhancing students' interactions. Nevertheless, there is limited in-depth knowledge about how students were engaged and what types of activities are engaging. This study incorporated quantitative and qualitative methods to provide a holistic view of students' engagement by analyzing statistical data gathered from questionnaires and student-generated photographs and narratives in interviews. This chapter starts with a summary of the current study and unpacks significant findings with interpretations relating to the existing literature in the areas of learner engagement, MALL, and a combination of those research studies in the learning context in China. This discussion is followed by implications for the theory and practice of MALL. By analyzing methodological limitations, I put forward recommendations for future research with mobile devices to support language learning based on the findings of this study.

The purpose of this study was to examine undergraduate students' engagement when they were involved in mobile learning activities for College English learning at a university in China. The results from the quantitative and qualitative methods have been presented in Chapter 4, with the questionnaire and interviews addressing the first research question and the interviews and photographs addressing the second. The scales of Extrinsic Motivation, Task Value, Intrinsic Motivation, Effort Regulation, Help Seeking, and Peer Learning from the participants were higher than average on a Likert scale of 1 to 7. These higher than average scores may be related

to how mobile support for those aspects of student engagement is more helpful than in traditional learning settings. The mediation of mobile support may provide a more appealing approach to motivate learners and access to peers and the instructor. Data from students' interviews are mostly congruent with the statistical results, with more in-depth information expanding this agreement. Photographs from students' engagement in learning activities and the interview content were analyzed collaboratively to incorporate a complete picture of students' lived experiences of mobile-assisted learning. Six themes were generated from the photographs and interviews: cellphones as the major learning devices, a support for inquiry between students and the instructor, elevated learning efficiency, more possibilities of independent learning, and drawbacks of mobile learning.

Engaging With Cellphones for Unique, Active, Interesting, and Scaffolding Learning

In this study, the implementation of Rain Classroom as a learning platform in the College English class in this university represents how using mobile assistance in a F2F setting creates a hybrid learning environment, which is partially due to the COVID-19 pandemic that enforced a transition from traditional learning approaches to a mobile technology-assisted learning model. Not long ago, researchers (Wang & Cui, 2016; Zhang & Pérez-Paredes, 2019) argued that the development of MALL in China was still on an initial stage of development, especially in college English education. Within a few years under the inspiration of innovative educational reform and the situation of the pandemic, mobile-assisted learning has gone through a soaring improvement, allowing mobile support to function progressively in College English classes where students and instructors take advantage of it.

In the current study, given the large size of a typical College English class, mobile devices in students' hands are regarded as a mediating tool that connects students and the instructor for inquiry, communication, consultation, and feedback. Students were granted an

exceptional experience in which they engaged in mobile learning activities that required more participation for knowledge construction than usual and fostered initiative, independent learning. Rather than one-way knowledge input from the instructor's side, multiple ways of information exchange mediated by learning platforms raised students' attention and increase opportunities of using the language. In this way, explicit instructions of English skills as a conventional approach in traditional English learning are beginning to be replaced by a more interactive alternative for knowledge exchanges. With the switch of pedagogical approaches realized through MALL, students were gradually taking the role of active participants who are engaged in learning through their own initiative instead of being silent, passive receivers. Extrinsic learning motivation, which used to be the primary driver in EFL learning (Sang, 2017; Zhang & Zuo, 2019; Zhang et al., 2015), is being balanced by intrinsic learning goals as students acknowledged the enjoyment of engaging in the mobile learning phrases (pre-class, during-class, and after-class learning). Instructors' feedback was often instant, scaffolding learners' knowledge expansion in a timely manner. The following sections will elaborate on a detailed discussion of learner engagement in mobile-assisted learning activities (MALL), connecting the findings to larger themes in relation to the research questions.

Mobile Learning Is a Unique Opportunity for Enhancing Student Engagement and Knowledge Construction

As a result of coping with the COVID-19 pandemic, the return to campus for F2F lectures after a complete online learning period has accelerated the formation of this unique type of MALL involving three phases, namely pre-, during-, and after-class College English learning. Distinguished from prior adoption of mobile support for only a few occasions before the pandemic, MALL has been integrated wholistically for advanced learning purposes (previewing learning materials, exchanging information, navigating feedback, etc.). Given the circumstance

of combining synchronous and asynchronous learning features into physical classrooms, students perceived enhanced engagement for this course and independent learning and more effective ways for knowledge construction as evident in the statistics and interviews. This finding echoes some other research studies (Andujar & Salaberri-Ramiro, 2021; Cho & Castañeda, 2019; Han & Lu, 2020; H. Huang, 2021; Martin & Bolliger, 2018; Wang et al., 2009; Xue & Churchill, 2020) that demonstrated enhanced learner engagement in the ESL and EFL learning process with mobile learning support.

This study exemplified various features carried on Rain Classroom that have provided students with distinguished learning experiences using mobile devices. Through operating on their preferred devices (e.g., cellphones, tablets, and laptops), students participated before-, during-, and after-class activities: previewing learning materials, marking confusing content, taking attendance, submitting answers, communicating with the instructor and peers by sending bullet screens, viewing live PowerPoint slides on personal devices, and so forth. The multimodal options of language input through technology scaffolds language practices (Suvorov, 2022). Both the option of taking cellphones into the lecture for learning purposes and the operations on mobile devices for learning activities have altered the way of learning in a formal setting and students' perception of what to engage and how to engage in the classroom.

It is notable from the findings that the availability and portability of personal devices and the easy access to learning platforms played an essential role in students' overall positive attitude towards mobile, seamless learning during the lecture and in their spare time. It was well illustrated that cellphones are the most popular language-learning device both in class and out of class for university students in China. From the questionnaire, 98.54% of students reported using a cellphone for learning; in the interviews, students confirmed that every student in this class

owned a cellphone, whereas the number students who had tablets or laptops were limited. The ubiquitous use and ownership of cellphones over other devices and the preference of selecting cellphones for learning among university students created a unique context where cellphone-supported learning activities played an important role in students' active participation in the classroom. This phenomenon also reflects smartphones as an explicit mediating tool for introducing activities and direct learning objects. This finding is compatible with findings from a previous research study that investigated the usage of smartphones in a university in China: every college student owns a smartphone while laptop or tablet ownership is comparatively lower, meeting the requirement for accessing various forms of mobile-assisted learning activities (Zhang & Zuo, 2019). Thus, it could be inferred that because of the high use of cellphones among university students, cellphone as a prior choice for classroom learning created the foundation of the hybrid College English learning through personal devices.

Besides the availability of devices, the easy access to learning platforms through cellphones enabled a quick login into Rain Classroom and other learning apps, supporting an instant transfer to a learning status and an access to rich and varying learning resources that cannot be carried in a single textbook. This feature has been appreciated in several studies that examined the usage of mobile learning among language learners (Calabrich, 2016; Hou & Aryadoust, 2021; Kruk, 2017). The portability of cellphones is another advantage of engaging in learning on mobile devices, as well illustrated in some studies (Kukulska-Hulme & Viberg, 2018; McCarty et al., 2017; Yedla, 2013) where cellphone users learn anywhere anytime. The current study also illustrated the usage of apps for learning at students' convenience, as discovered in other research studies (Bensalem, 2018; Klimova & Polakova, 2020) that demonstrated the flexibility of time and location of accessing internet-based apps for improving

ESL students' vocabulary learning. The advantage of portability is outstanding not only because of the number of resources loaded on learning apps but also due to the seamless communication and interaction with the instructor, and peers to broaden their knowledge scope.

Another important finding from this study is that compared with the statistical results from the MSLQ manual, students in this study reported higher scores on learning strategies of help seeking and peer learning through mobile support. It could be inferred that in this hybrid learning environment, students had more opportunities to ask for help either from their instructor or peers via communicating through Rain Classroom and social media. Rain Classroom provided them with more possibilities of learning from peers through viewing assignment results (e.g., multiple-choice answers, translation, and compositions) displayed to all the students. This finding is similar to a recent study that investigated MALL in collaborative learning for EFL learners in Saudi Arabia. Al-Ahdal and Alharbi (2021) found that grouping students in mobile learning activities for vocabulary retention contributed to students' vocabulary learning, willingness to helping peers, and skills of collaboration, ensuring a remarkable improvement in learner engagement and motivation. Beyond learning from those who are more knowledgeable in this class, students also turned to learning apps for assistance on vocabulary and translation, especially during their spare learning time to extend the possibilities of obtaining new knowledge. This finding is in alignment with Nguyren et al.'s (2018) study that examined the effects of a translation app on students' learning interests and motivation. Students were motivated to use a translation app for learning and encouraged to speak in the target language. Similarly, in Zhang et al.'s (2019) study, the collaborative participation in mobile-base drama reduced students' anxiety of speaking in a foreign language. Thus, students in the College

English class presented a tendency to collaborate with peers, interact with the instructor, and obtain assistance from internet-connected learning apps.

With this learning platform of Rain Classroom, the instructor was able to connect both short-term and long-term learning goals with students' daily practices, through which students could identify the focus of exercises and linguistic skills that eventually contribute to final exams and language acquisition. Prior studies (e.g., Peng, 2015; Zhang et al., 2015) that indicated that university students were confused about what to engage and how to engage when they first enrolled in College English since either their personal goals were not clear in this compulsory course, or they did not find it relevant to their area of interest, leaving them receiving explicit instructions aimlessly. In the current study, through incorporating three learning phrases, pre-, during-, and post-activities for previewing, practicing, and reviewing, the instructor made sure students were clear about the learning goals and language focus of each class and helped build connections with students' prior knowledge. By integrating exam or CET-4 related materials, the instructor enlarged the capability of language learning for those purposes in the long run.

Though those short-term and long-term learning plans could be implemented in traditional ways, the adoption of mobile learning modules makes them more accessible and acceptable for students since students perceived the convenience of completing activities at their fingertips and the enjoyment of discovering their advantages or drawbacks in learning English. Building on the known and prior knowledge is important; students appreciated the ease of previewing on Rain Classroom to mark whatever they had difficulties to understand and discover their strengths and weaknesses. This finding is similar to Li et al.'s (2020) study that examined the effect of integrating Rain Classroom into a Computer-aided Landscape Design course where students perceived a high clarity of the course; namely, they were clear about what to expect from this course and what could be offered to them, because of the opportunity of previewing

and reviewing knowledge and marking any confusions. Therefore, the mobile activities integrated into the three phases of learning notified and clarified what to engage and how to engage in College English classes, allowing a seamless learning opportunity that students can capture.

Students perceived the ease of operating and engaging on Rain Classroom, including but not limited to submitting answers, posting questions, sharing opinions, obtaining learning resources, and omitting tasks on Rain Classroom. This finding is in alignment with Yu and X. Yu's (2019) study that tested students' perceptions of using Rain Classroom. In their study, Rain Classroom has been well accepted by learners because of the ease of using it without training, positively influencing learners' acceptance of technology for learning purposes. Besides, consistent with Yu and L. Yu's (2021) study that investigated students' perceptions of the usability of Rain Classroom, the current study exemplified the easy access to and the effectiveness of working on the platform that satisfied students. Despite limited studies on the employment of Rain Classroom features in College English classrooms, another study during the COVID-19 pandemic demonstrated the prominent advantages of online learning platforms, one of which is Rain Classroom. In Huang et al.'s (2021) study, the researchers examined the usage of several online learning platforms, and Rain Classroom was one of the leading apps that students indicated a perceived preference for online learning. Similar to the current study, communication via bullet screens is the most distinguishing feature that engages students' learning according to their experiences.

In all, mobile learning activities that were integrated into pre-, during-, and after-class learning phases of College English positively affected learner engagement. The availability of personal devices, easy access to learning platforms, and portability of cellphones construct the

foundation of increasing learner engagement. Moreover, through mobile-assisted learning, the opportunities of help-seeking and peer learning were enlarged. The integration of short-term and long-term goals in the three phases of learning activities informed students about what to engage and how to engage. The ease of obtaining learning resources and completing tasks on Rain Classroom granted unique experiences of engagement in English learning beyond traditional ways of learning.

Students Are Active Participants of Knowledge Exchange and Reflection

The current study has demonstrated students' active participation in mobile-assisted learning activities. Some previous studies (e.g., Li et al., 2016; Zhang & Guo, 2015; Zhou, 2012) argued a characteristic shared among many Chinese students, being passive in the process of English learning as highly related to teachers' explicit instruction. Yet, distinguished from traditional classroom participation through either verbal answers or hand-out assignments, the learning platform, Rain Classroom, enables multiple ways of engaging in-class activities through fingertip manipulations. The ways of participating in activities embrace textual messages and images that could be shared with other learners, increasing students' willingness to exchange information. This shows the capability of text-based interaction as a unique feature of technology-mediated learning, as Warschauer (1997) indicated. Distinguished from paper-based idea exchanging, text communication is more flexible and efficient. This finding aligns with another research study on students' mobile learning experience in F2F classrooms that students were no longer "empty containers ready to be filled" (Li et al., 2020, p. 364) since this type of learning approach granted students more opportunities for autonomous learning and teacher–student interaction embedded in presenting, listening, questioning, answering, discussing, or even debating.

From students' narratives of interactive approaches, such as bullet screens and submissions of tasks, with their instructors, it could be inferred that the integration of Rain Classroom allowed multiple ways of communication through input from personal devices. This echoes Warschauer's (1997) guidelines for creating an collaborative learning environment through many-to-many communication. The more students communicate with peers and their instructor, the more they input and output the language. In this way, students obtain more opportunities for learning through language in a speech community. Those approaches are particularly friendly for those who are not good at presenting ideas in public. Bullet screens that display anonymous posts from students is an outstanding feature of Rain Classroom that lowered students' anxiety for presenting ideas in public. Bullet screens echo the previous studies of chat-based communication through instant messages by So (2016) and Winet (2016) who highlighted the unique feature of writing and responding immediately in real-time communication for enhancing students' learning motivation. In the current study, in combination with some students' characteristics of shyness, it is a wise option to leave comments without showing their names.

In previous studies, researchers also highlighted the feature of anonymous responses. Gao and Shen (2021), for instance, indicated in their study that anonymous comments on mobile technology can reduce students' embarrassment and nervousness of using a foreign language for communication, which usually occurs in F2F conversations. Similarly, Al-Bogami and Elyas's (2020) study that adopted iPad apps also demonstrated an increase in students' engagement in EFL classes. In their study, students were more confident to share opinions and thoughts because of anonymous answers submitted through a learning platform.

Expressing opinions and inputting language through submitting textual messages and images of compositions or notes allow for alternatives of information exchanging, from where students actively compare and contrast ideas for comprehension, appreciation, and acquisition. This finding is a reflection of Kearsley and Shneiderman's (1998) engagement theory. Technology-assisted learning enables students to work together for reporting results and evaluating answers, during which students' cognitive skills, such as problem-solving and decision-making, can be cultivated. It also echoes another research study that elaborated on technology-assisted collaborative learning. Wang and Liao (2017) demonstrated that technological support such as Moodle—an online course management platform that offers syllabus access, quizzes, notices, lecture resources, assignment submission, and discussion forums—enables students to equally contribute to the learning community and participate in the construction of knowledge by sharing ideas. The increased interaction symbolizes active engagement, fosters a deeper understanding of the learning materials, and leads to achieving learning goals.

Thus, it can be concluded that the employment of mobile devices for English learning activities opened new windows for students' active participation. Instead of receiving explicit instructions passively, students shared thoughts with peers through multiple approaches, engaged in communication with the instructor, and input language, displaying more initiative in constructing knowledge.

Grades Count—Interest Also Matters

The current study reported higher extrinsic motivation than intrinsic motivation as evaluated by students in the questionnaire. Besides, it could be inferred from students' narratives and visual evidence that they took into account grades of the final exam and CET-4, aligning with previous research studies (e.g., Sang, 2017; Zhang & Zuo, 2019; Zhang et al., 2015) that

university students in China learn a foreign language for extrinsic motivation, such as for the return of good grades and passing exams. Yet, it is worth noticing that students' extrinsic motivation did not outweigh intrinsic motivation significantly, as illustrated in the statistics and students' interviews. Students expected to achieve higher scores in daily participation and final exams, whereas they also demonstrated a strong interest in participating in the whole learning process, showcasing the value of mobile learning activities. They realized the meaning of committing independent learning, such as completing preview and review tasks to comprehend the learning materials and practice linguistic skills through personal needs-tailored apps, thus demonstrating initiative to engage in mobile learning activities.

Most importantly, Rain Classroom and other mobile apps they used for learning English provided them with platforms to complete those tasks conveniently, share information or materials at ease, and support the needs of learning English for intrinsic purposes, such as being enjoyable and fulfilling. This finding is congruent with other studies that highlighted learners' affective engagement in mobile learning activities (e.g., Asraf & Supian, 2017; Cho & Castañeda, 2019; Jones et al., 2017). In particular, peer support, community learning, and self-directed learning have been exemplified as enjoyable learning experiences with mobile support. Accordingly, with the assistance of mobile devices, they could develop an interest in the engagement process and enhance active and autonomous learning.

Achieving recognition in the College English class, obtaining higher participation scores, and releasing burden for the final exam are benefits students obtained from mobile assisted learning. This finding echoes another study that demonstrated the helpfulness of mobile apps for test achievement (Klimova & Polakova, 2020). More importantly, students in the current study felt engaged in the varying mobile learning activities that required their input of language to continuously interact with learning materials, peers, and the instructor. From the statistical

results, it could be inferred that students considered extrinsic motivation equal to task value, representing their acknowledgment of the value of mobile-assisted activities, which led to taking the initiative to participate in classes. Yang's (2020) study could explain the relation between task value and intrinsic motivation: the recognition of mobile learning task values can positively influence students' intrinsic learning motivation. The adoption of mobile devices enabled real-time interactivity and feedback through playful engagement in the activities (Tai et al., 2022). Thus, it is not surprising to see high perceived task value and a comparative balance between extrinsic and intrinsic motivation.

The finding of students' transition to a more intrinsic learning motive is a positive response to the Ministry of Education in China that called for a shift from an exam-oriented to a quality-oriented paradigm that emphasizes practical usage of a foreign language and development of students' interest in learning through constructive approaches (Ministry of Education, 2007). Advocating for pedagogical reform from extrinsic goal orientation to a more intrinsic value-oriented instructional approach has been put forward for more than a decade. The current study has established a transition to welcoming English learning for a more intrinsic purpose that caters to students' interests, personal needs, and enjoyment.

In the current study, students established an affective engagement through Rain Classroom and other self-directed learning apps because of the efficient ways of interacting with others (bullet screens and communications on social media). This result is similar to several existing studies (Guo & Wang, 2018; Li & Song, 2018; Yu & Yu, 2021), in which students presented an agreement on the effectiveness and usefulness of mobile learning platforms or apps (WeChat and Rain Classroom) for interactive features (e.g., answering questions, participating in discussions, and sharing lecture content) and showed higher engagement. In addition, the current study provided evidence for students' independent learning and motivational engagement in

continuously using self-learning apps. The persistence of using those apps accommodated students' willingness to obtain CET-4 related language skills and strategies and satisfied personal interests. This finding is contrary to a previous study that investigated the potential of vocabulary apps for enhancing students' vocabulary knowledge in German and indicated students' lack of persistence in using mobile devices for self-learning because of a complex login process (Ludwig, 2018). Therefore, it could be interpreted that the easy access to learning apps (Rain Classroom and other apps for independent learning) on cellphones plays an essential role in a continuous mobile learning routine.

Students' intrinsic motivation has also been supported by using unique features that could not be achieved without mobile support. For example, students not only found the bullet-screen messages useful for communication but also enjoyed the new way of interaction. This way of interaction has raised their curiosity about this feature and the coming unknown messages that grabbed their attention so that they could receive others' opinions. Increasing students' attention is a crucial element for raising students' learning motivation and thus engagement. Keller (1987) put forward the ARCS Model for instructional design that emphasized four elements (attention, relevance, curiosity, and satisfaction) of increasing learner motivation, among which attention has been regarded as the prerequisite for learning. Thus, notifications on Rain Classroom and other learning apps that maintained students' continuous attention had a positive effect on their motivation and engagement.

Students have demonstrated a higher level of learning strategies of help-seeking and peer learning than average and the scores in the manual. The reason may at least partially be attributed to the ease of the learning platforms and social media on smart devices. Students enjoyed seeking help through the internet that has solved many learning problems, being one of the most important findings from the interviews. The use of mobile devices during their spare

time provided students with choices of self-directed learning because of the variety of English learning apps they could choose from. Some learning platforms, such as online dictionaries, translation, and shadowing, have created possibilities for students to engage with. Learners could simply do searching online before they turn to other knowledgeable individuals for support, leaving them more flexibility and saving them time. Other studies also highlighted the usefulness of mobile apps for self-directed learning and assistance. For instance, Lai and Zheng (2018) reported in their study that students expanded resources and the use of target language through frequent use of mobile apps, namely Google Translate and Google search engine, which advanced their learning comprehension and productivity. Thus, the use of a mobile device that connects to the internet is creating more learning opportunities besides peer learning and instructors' scaffolding.

All in all, students' extrinsic learning motivation is slightly higher than intrinsic learning motivation given the necessity of passing exams and CET-4 for graduation. Yet, a balance of the two motives has been sought for in the mobile learning context with more enjoyment of interacting in the learning community created and students' interests and personal needs better catered for. Moreover, students demonstrated an affective engagement in participation in mobile-assisted interactions for help-seeking and peer learning and presented consistency of using self-learning apps to accumulate language skills.

All Learners Are Scaffolded in a More Instant, Visible, Specific, and Affective Manner

The significance of feedback to learners for language achievement and perceptions of this type of learning experience has been emphasized in the area of EFL. A notable finding from this study is that Rain Classroom allows a more accessible approach of inquiry that scaffolds all learners in an instant, visible, specific, and affective manner through collecting students' answers and statistically analyzing multiple-choice answers, thus navigating instructions.

Students revealed that their learning efficiency had been highly improved in submitting answers, presenting reports of submission, and navigating instructors' feedback, among which the mobile devices in the F2F classrooms are mediating tools in a more efficient way. As Ellis et al. (1994) indicate, the language learning process should involve a procedure of language input, output, and feedback. The mobile activities made the learning process easier, on track with this procedure by collecting input from individuals, presenting language output, and directing instructors' feedback. Similar findings also presented in previous studies, such as in Klimova and Polakova's (2020) study, in which students benefited from the corrective feedback mediated by a mobile learning application. Hence, with the mobile learning option, students could obtain more instant support from the instructor than in the traditional learning settings.

Students perceived a relatively high value for mobile learning activities, as mainly displayed in their interaction with the instructor using bullet screens, which named a new and innovative approach to connect students and their instructor. Traditionally, the ways of communicating with instructors have been limited to verbal presentations and assignments, which usually require time for submission and responses from the instructor. The adoption of digital technologies, such as desktops and laptops, has welcomed other possibilities for communication between students and their instructor. The learning community that supports multiple ways of interaction among peers and their instructors through the internet has been appreciated in research studies. In particular, Anderson (2011) put forward the concept of community of inquiry between students and their teachers in asynchronous or synchronous communication. Teachers are committed to constructing an online learning community where students and their teachers can interact and make an inquiry. This pedagogy is also suitable for learning in this hybrid learning context where students make use of bring-one's-own devices that worked as a mediation of inquiry between students and their instructors for learning output that

contributed to sharing and building ideas. Students' use of live messages to answer or ask questions to their instructor equals synchronous learning; they commented on learning materials when they are previewing, equivalent to asynchronous learning.

Those features of Rain Classrooms are a combination of the benefits of online learning and F2F learning with a particular contribution to the inquiry between students and instructors. This type of communication is not rare in a completely online learning environment where students put comments in chat boxes or in group discussions, which are followed by the instructor's feedback. Yet, this type of learning is not commonly seen in F2F learning situations and therefore constructing a unique learning environment that welcomes online learning features in in-person instructions.

Compared with traditional learning approaches, such as submitting answers through hand-outs, the digital input through the online learning platform led to an instant collection of those answers that could be reported to the instructor in seconds. As an essential component of increasing students' language skills, instant corrective feedback attained through digital support is critical. Similar findings have been reported in other studies where participants perceived it practical to work on mobile learning activities in F2F learning when they could obtain instant support from their instructor and thus achieve higher proficiency (Pernjek & Habjanec, 2015; Xue & Churchill, 2020; Yu & Yu, 2021). The instant support, in turn, facilitates students' concentration and active participation in the lecture.

Since Rain Classroom could display all submitted answers, students benefited from the visual illustrations of those activity results that share answers from individuals. Instead of viewing ones' own results of activities or answers to questions for self-evaluation as typically happen in traditional classrooms, students could see the accomplishment of all the students for comparisons (e.g., average score and rate of each answer). In particular, the statistical results of

all submitted answers provide an explicit understanding of the overall trend and elaborate on the classification and analysis of answers. Likewise, instructors' feedback on those questions is more observable. Under the navigation of statistics, feedback is more specific, with priority given to problematic questions. Research has indicated the significance of teachers' specific, individualized, and concrete feedback on improving language skills and scaffolding linguistic knowledge (Woodworth & Barkaoui, 2020). In this way, the instructor could spend time on the questions that deserve more attention. Moore's (2016) study involving a similar technique, screencasts in a web-based course, confirmed the advantages of visual support for providing feedback for assessments. Moore argues that presenting activity results with visible exhibitions helps instructors give specific explanations in detail according to the rubric for improvement. Moreover, given that students' comments or answers sent on the bullet screen were anonymous, students were less concerned about making mistakes and more willing to accept corrective feedback from the instructor. Kartchava et al. (2020) pointed out a concern about language teachers' corrective feedback for affective consequences, namely whether that will lead to students' positive or negative motivation to keep learning. It has also been suggested to be cautious about the timing and ways of providing feedback to students. In this case, submissions on Rain Classroom granted the freedom of hiding students' identity via anonymous submissions and avoided the concerns of receiving feedback.

In sum, it could be assumed that the feedback from instructors through learning platforms is more instant than in traditional ways of teaching. The direct submissions of assignments and visual results from statistical reports as supported by the learning platform presented learners a more straightforward approach of self-evaluation and comparison. This feature also informs the instructor to provide more specific feedback toward problematic questions and scaffolds

language skills development. Given the safe learning context of sharing answers with protection of students' identities, instructors' feedback is considered more acceptable and affective.

Still a Way to Go: Collaborative Learning and Self-Regulation

From the results of questionnaires in this study, students reported higher peer learning than that in the MSLQ manual. It may be due to the ease of communicating on social media, where students could ask opinions or negotiate ideas with peers about group projects or assignments. Compared with face-to-face conversations, students found this way of communicating more relaxing, especially when they talk to other peers whom they do not know well. Collaboration among peers mainly appeared in those situations when conversations for clarity or negotiation were in need. Collaborative work among peers through mobile learning, which was advocated by many researchers of MALL (H. Huang, 2021; Ilic, 2015; Knight et al., 2016; Kukulska-Hulme & Viberg, 2018, Zhang et al., 2019), however, was not taking a dominant place in mobile learning activities in the current study.

The current study, though revealing an undergoing switch from a teacher-dominated teaching approach to student-centered pedagogies, showed that students have not yet taken a central place. Given that the major pedagogies are still based on a teacher-centered model, the lack of contemporary theories, particularly of constructivism, led to College English classes being still under a teacher-centered, instructional approach for passive learning (Li, 2014). Under the framework of social constructivism, collaborative learning has been considered the most commonly employed approach to actively engage learners (Barkley, 2009; Tinto, 2012). The integration of activity-based learning, inquiry-based learning, and cooperation has been identified as instructional approaches to promote students' active participation, independent inquiry, practical ability, problem-solving skills, and teamwork and construct a student-centered and self-directed educational setting (Ministry of Education, 2007). In a foreign language

learning context, collaboration in activities among students calls for attention paid to the collaborative project, enables communication using the target language, and cultivates initiatives to complete a common objective. Therefore, in alignment with MALL researchers' expectations, instructors are encouraged to integrate collaborative learning activities to promote more student initiated participation.

Though students' self-evaluated score of self-regulation was comparatively higher than the other two strategies, help-seeking and peer learning, students presented problems with concentration on English learning apps, especially when they used them for independent learning. As previously discussed, the notifications of learning materials can be used on students' cellphones as a reminder for users to finish tasks. However, it is also revealed by some students that the notifications on cellphones, mainly from social media and other entertainment apps, could be a disturbance. This situation has been reported in some of the studies as well. For instance, Kay et al. (2017) found in their research that though mobile devices had the potential to improve learning, mobile learners were distracted from the learning tasks because of entertainment features and communication through social media. Lai and Zheng (2018) reported that students were likely to be distracted by WhatsApp messages when they used mobile devices for self-directed learning. It is also worth noting that for the in-class use sections, students seemed to have better self-regulation when using cellphones, which might be due to their interests in the mobile activities and the instructor's monitoring through quizzes on Rain Classroom or calling attendance as indicated by some students.

Accordingly, mobile-assisted learning as achieved in the College English class has overall exemplified positive effects on students' engagement except that collaborative learning and self-regulation were not as successful as expected. Either following the frameworks of social constructivism and engagement theory or language learning theories that are in support of

collaborative learning, instructions with MALL in College English classes are still in need of improvement for a more engaging learning atmosphere. Besides, the drawback of disturbance from cellphones is also evident and worth paying attention to for solutions.

Implications for Theory

As discussed in previous sections, existing research studies have either focused on Chinese students' engagement in online learning classes or self-directed mobile learning, where students use cellphones as dominant devices for language achievement. The current research is situated in a newly developed hybrid learning environment, which is partially caused by the crisis of COVID-19. The combination of features from online learning and the traditional classes has been rarely studied, leading to the necessity of investigating student engagement in this unique learning context. In previous studies, mobile-assisted activities showed up in College English classes for occasional use during the lecture time. In this study, the mobile activities have been embedded not only in the whole lecture but also for previewing, reviewing, and even examinations, realizing a full integration of MALL in all types of activities. The findings from this study thus uncovered the significance of employing mobile-assisted learning that fits the educational context of Chinese university students.

In this study, Rain Classroom was used as a platform not only for distributing learning resources but, more importantly, as a medium for the inquiry between the instructor and students, making the communication more approachable. This finding is partially consistent with Kukulska-Hulme and Shield's (2008) and Kukulsa-Hulme and Viberg's (2018) perceptions about collaborative MALL, which was developed based on the lens of social constructivism. They argued that earlier generations of MALL were aimed at delivering content to learners; yet MALL is progressing toward a more interactive approach that students learn language skills

through the interaction with peers and instructors. However, a combination of collaborative learning with foreign language learning pedagogies as they advocated, such as game-based learning and task-based language learning that usually involve real-life communications and collaboration among peers, was not represented in this study.

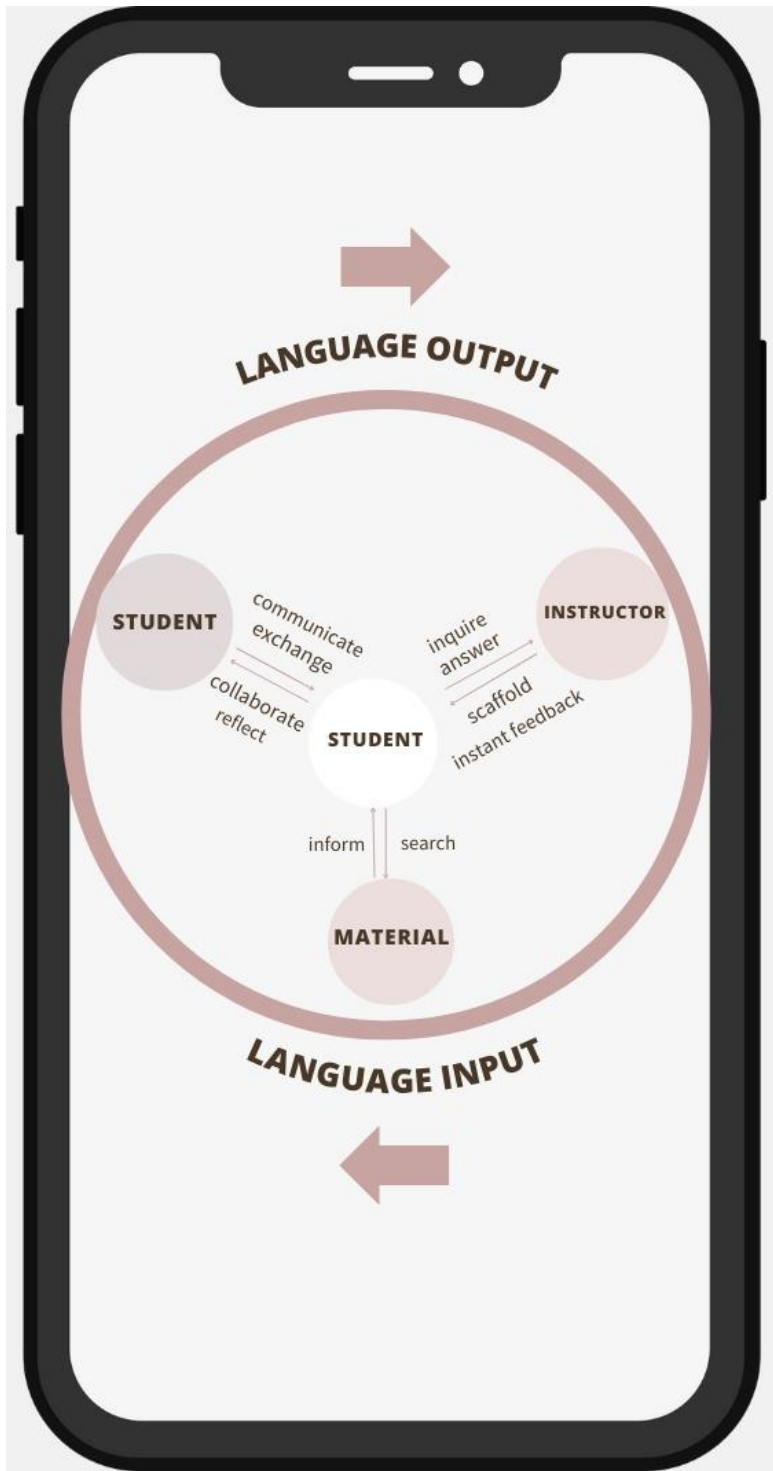
Research findings from this study of undergraduate students' engagement are broadly in harmony with social constructivism and engagement theory. The mobile learning platforms were operated as mediating tools for bridging multidimensional interactions: student–student, student–instructor, and student–learning materials, consistent with Vygotsky's belief of social, cultural interactions for co-construction of knowledge and the concept of mediation for knowledge development (Vygotsky, 1978). Since the framework specifically for MALL has not been appropriately developed from the literature (Viberg & Grönlund, 2013), a suggested model according to the findings of the current study is provided in Figure 27.

As shown in this model, using mobile support as a mediation in this circle of language learning, students can build interactions with other students, the instructor, and learning materials. Students communicate, exchange information, collaborate with other students and reflect on this interaction. Similarly, mobile support bridges the gap between students and their instructor: students make inquiries and answer questions to the instructor; the instructor provides scaffolding and instant feedback to students. Mobile support also enables students to search for learning materials that inform students with language skills. Those interactions contribute to more active participation in pre-, during-, and post-learning activities and engagement in language input, output, and knowledge construction. Those learning activities may be realized in traditional EFL settings but with challenges of support to each individual. The option of mobile learning allowed an efficient approach of engaging in those learning phases, coupled with more

scaffolding opportunities from instructors for language acquisition. With guidance from instructors or more capable peers achieved through mobile-assisted learning, students devoted

Figure 27

A Suggested Model of MALL



active engagement in developing language skills from their current level to a broader level, thus making a progress of a wider range of knowledge, in alignment with the zone of proximal development as Vygotsky (1978) put forward. Warschauer's (1997) argument of learning

through language is also presented in this model as learners practice language through engaging with humans and materials, during which they input and output language for constructing language skills.

Implications and Recommendations for Practice

Existing literature has developed systematic models for online learning and CALL, emphasizing potential elements for a computer-supported online learning environment. For instance, Anderson's (2011) online learning model uncovered four overlapping lenses for developing knowledge through five types of interactions: student–teacher, student–content, teacher–content, content–content, and teacher–teacher interactions. With those principles, teachers are under the framework to organize cooperative activities and provide guidance for learners. However, a guideline for implementing MALL in F2F classrooms, which appeared in more recent years than either online learning or CALL, is still under exploration and requires a solid theory for guiding this type of learning. A combination of the features of synchronous learning, asynchronous learning, MALL, and traditional in-person learning has been put forward as a framework for this hybrid learning setting.

This research is significant for educators and decision-makers because it confirmed the usefulness of mobile activities for students' engagement in F2F College English classes. Students perceived overall positive attitudes toward using the Rain Classroom platform for submitting assignments, previewing and reviewing learning materials for autonomous, self-directed learning, communicating with the instructor, getting instant feedback, and so forth. Apparently, those benefits of using mobile learning activities cannot be easily achieved in traditional classrooms without digital support. The transit from a teacher-centered pedagogy to a more student-centered approach has shown a positive outcome in learner engagement as

exemplified in students' more active participation in mobile learning activities and interactions with peers and instructors. Given the findings from this study, it is expected that the stereotype of cellphones for entertainment be lessened, and the potentials of MALL be recognized by more educators for the benefits of catering to individual learners, fostering connections, elevating engagement, and potentially increasing English skills.

Although this study was conducted with students from two College English classes from a university, the results of the study may be used to inform instructors from other universities and teach other subjects. Instructors are expected to embrace new and innovative instructional approaches that could be derived from other teaching pedagogies or technologies. For instance, in this study, the implementation of mobile learning activities is mainly in accordance with social constructivism that was developed in a Western context and imported to China in recent years. The integration of this Western theory and the features of synchronous and asynchronous learning through mobile devices has demonstrated positive outcomes for learning engagement. From here, it is expected that this type of hybrid learning could benefit instructors for their teaching designs and students for advanced active engagement in higher education. Meanwhile, university instructors are expected to share their experiences and expertise in curriculum design to elevate the usefulness of mobile device features and mobile learning activities.

This study also addressed a challenge in using mobile technological support for learning purposes: self-regulation. Apparently, students were having some issues with self-regulation both in formal learning situations and in self-directed learning that were worth paying attention to. Self-regulation is not a new problem in EFL; rather, it exists in almost all types of learning and requires students' self-consciousness to regulate their learning behaviours. Therefore, it is a reminder for instructors to make use of resources for maintaining students' continuous attention

to the learning activities and satisfying their learning needs, demonstrating an even higher demand for students' engagement with motivational and active participation.

This research study also affirmed that Chinese English learners could be engaged to actively participate in foreign language output when the learning environment is motivating, multiple choices of expression approaches are provided, and their identities are safely protected. Whether relying on the assistance of technological devices or not, instructors should keep in mind students' expectations and inner requests for expressing in a comfortable and supportive foreign language learning environment.

Instructors' instant feedback as navigated by mobile activity results was highly valued by students. These students recognized their limited language proficiency, the need for improvement, and how a sense of competitiveness pushed their language learning and engagement forward. Thus, it is suggested that instructors make use of mobile or other digital supports to effectively accumulate evidence of students' language proficiency of reading, writing, listening, and speaking skills in an effort to provide comprehensive feedback that helps students' success.

Strengths and Limitations

Mixed methods designs have been widely used to investigate breadth and depth of students' cognitive development; yet, a combination of questionnaires and photo-production visual method has rarely been found in the existing literature for examining and exploring student engagement. There have been studies using visual methodologies for understanding students' learning experiences in certain circumstances and finding this way of learning about young kids efficient (e.g., Galbraith & Lancaster, 2020; Harwood et al., 2019). Nevertheless, not many attempts have been made with older learners and for language learning experiences. In this study, this approach also fits older learners, namely university students, for promoting interest in

participating in this research project and enabling more autonomous roles in handling research data. Students used photographs to present the engaging moments and recalled those memories using those photographs in the interviews. This approach has been regarded as useful and helpful, though it did not appear in many other studies that have similar research purposes. Therefore, the research design in this study verified the possibility of integrating quantitative statistics, visual data, and interviews for a more in-depth understanding of students' perspectives.

One limitation of this study is the application of the research findings to other learning contexts. The participants are from two classes of College English that were taught by the same instructor. Attributing to the rapid development of mobile-assisted learning in the past few years in China, Rain Classroom and other English teaching and learning platforms are not solely implemented by this instructor. English instructors in this university and other universities have adopted mobile learning apps for teaching English, and a significant number of students are taking advantage of using them. This study is only conducted with a particular group of students due to the limited access to the research site. For a holistic understanding of student engagement in a wider context, students from other College English classes should be included in an investigation.

Because students in both classes used mobile learning activities for College English learning, there is no method to compare students' self-rated scores of engagements with or without mobile support using the questionnaire. Though the scores of engagements between participants in this study and the MSLQ manual have been compared, the learning conditions between those participants may vary significantly, and multiple factors might have affected the differences in scores. Thus, it still is not convincing enough to conclude that student engagement has been significantly influenced by mobile learning activities from the statistics.

Future Research

The current study explored the effects of mobile learning activities on one perspective of cognitive development: learner engagement. Though learner engagement and academic achievement are closely connected and resonate with the literature, it is equally important to take into consideration learner language proficiency and achievement into investigation with the assistance of mobile support. Thus, standardized English test scores, either for the final exams or for CET-4, can be evaluated in future research studies to confirm the relation between MALL and language skills development.

This study is restricted to learners as participants for their perceptions of mobile support, representing the perspectives of a single population of the learning community, which in fact consists of both learners and language teachers. Researchers can target instructors for their perceptions of MALL that may trigger different findings and inform the reform of FL teaching pedagogies and practices from other angles. As such, instructors who employ mobile learning activities in their classes can be recruited for future investigation, which may elicit practical guidance for MALL implementation in College English classes.

In order to obtain a more in-depth understanding of the influence of mobile learning activities on student engagement, other research approaches and longitudinal designs can be combined for investigation. For instance, self-regulation has been identified as a challenge for MALL from the current study. Keeping this identified problem in mind, researchers could conduct action research by negotiating with language instructor collaboratively for a solution and further test the practice of it through the cycle of reflecting, planning, acting, observing, and reflecting (Dickens & Watkins, 1999) and lead to further inquiries about wise solutions of this problem. The data collection in this study was finished within 2 months due to an intense

schedule of a doctoral dissertation whereby longitudinal studies that explore participants' experiences through an extended period may generate more rigorous findings of students' engagement. Therefore, it is suggested to combine other research approaches and designs for a more rigorous investigation of learner engagement.

Conclusion

Through a collection of students' self-evaluated questionnaires, photographs of engagement in mobile learning activities, and personal interviews, the following research questions were answered:

1. To what degree are Chinese college students engaged in learning English as a foreign language, with the support of a mobile-learning platform?
2. What are undergraduate university students' lived experiences of engagement when they use mobile learning activities for English learning?

The statistical data from the questionnaires, which contain questions for motivation scales and learning strategies scales, and students' perceptions from the interviews collaboratively addressed the first research question, to what degree are Chinese college students engaged in learning English as a foreign language, with the support of a mobile-learning platform; the second research question regarding students' lived experiences were represented by the student-produced photographs in a combination of their explanations in the interviews. Those data were analyzed and interpreted under the frameworks of social constructivism, engagement theory, and collaborative learning theory to understand learner engagement in breadth and depth. The research findings from the photographs and the interviews show a high portion of cellphone usage that supports mobile learning and exemplified the features of portability, flexibility, and easy access to learning apps that construct the base of learner engagement. The data generated

from this section were categorized into the following themes: cellphones as the major learning devices, a support for inquiry between students and the instructor, elevated learning efficiency, more possibilities of independent learning, grade-supported learning, and drawbacks of mobile learning. The findings from the interviews confirmed most of the quantitative results that students' extrinsic motivation did not differ significantly from intrinsic motivation, and students obtained more opportunities for peer learning and support from others.

Through the investigation of learner engagement in mobile learning activities, it was interpreted that students had a positive learning experience with the support of mobile learning that fostered learner engagement. In this learning environment, students were no longer silent knowledge receivers but active exchangers who share information for knowledge construction. As well, students considered both extrinsic and intrinsic learning goals as their learning objectives due to the importance of passing exams and their affective participation in the learning procedure. Because the mobile learning platform, Rain Classroom, created more opportunities for sharing information, learners were scaffolded in an instant manner with specific feedback from their instructor. However, opportunities for collaborative learning among students were limited throughout the learning process; a big challenge for mobile learning as self-regulation is expected to be investigated in future research.

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Appendix A

Motivated Strategies for Learning Questionnaire in College English Learning

Please choose the option that best matches your opinion based on the Rain Classroom supported college English course you are taking this semester (Spring 2021). There is no right or wrong answer. The information in this questionnaire will be kept completely confidential. (Question2-question26 rate from “1=not at all true to me” to “7=very true of me”)

1. Please choose the device you use:
Smartphone
Tablet
Laptop
Desktop
other (please indicate)
2. In a class like this I prefer course materials that really challenges me so I can learn new things.
3. The reminding questions are all about using Rain Classroom for learning college English. In a class like this I prefer course materials that arouses my curiosity even if it is difficult to learn.
4. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.
5. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.
6. Getting a good grade in this class is the most satisfying thing for me right now.
7. The most important thing for me right now is improving my overall grade point average so my main concern in this class is getting a good grade.
8. If I can I want to get better grades in this class than most of the other students.
9. I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.
10. I think I will be able to use what I learned in this course in other courses.
11. It is important for me to learn the course material in this class.
12. I'm very interested in the content area of this course.
13. I think the course material in this class is useful for me to learn.
14. I like this subject matter of this course.
15. Understanding the subject matter of this course is very important for me.
16. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.
17. I work hard to do well in this class even if I don't like what we are doing.
18. When coursework is difficult, I give up or only study the easy parts.
19. Even when course materials are dull and uninteresting, I managed to keep working until I finish.
20. When studying for this course I often try to explain the material to a classmate or a friend.
21. I try to work with other students from this class to complete the course assignments.
22. While studying for the scores I often set aside time to discuss the course material with a group of students from the class.

23. Even if I have trouble learning the material in this class, I try to do the work on my own without help from anyone.
24. I asked the instructor to clarify concepts I don't understand well.
25. When I can't understand the material in this course, I asked another student in this class for help.
26. I try to identify students in this class whom I can ask for help if necessary.
27. Please provide comments for Rain Classroom supported College English class.
28. What is your major?
29. Which represents your year of university study?
 - Freshman
 - Sophomore
 - Others
30. Gender
 - Male
 - Female
31. What is your age?
32. Please provide your contact information if you are interested in participating in the reminding of the research study.

Appendix B

Chinese Version of Motivated Strategies for Learning Questionnaire in College English Learning

“雨课堂”辅助大学英语学习动机与策略调查问卷

请根据本学期（2021年春季）所修的大学英语课程，选出最符合你看法的选项，答案无对错之分。本问卷调查的信息将完全保密。（问题 2-26 请在“1=非常不符合”至“7=非常符合”之间选择）

1. 请选择你上大学英语课使用的移动设备：
手机
平板电脑
笔记本电脑
其他（请指明）
2. 以下问题均为使用“雨课堂”辅助上课学习的情况。在这样的课堂上，我更喜欢富有挑战性的教材内容，让我学到新东西。
3. 在这样的课上，就算难学，我也更喜欢激发我对于教材内容的好奇心。
4. 这门课对我来说最满意的地方就是尽可能彻底地去理解内容。
5. 当我有机会上这门课时，我会选择去做那些能让我学到东西的作业，哪怕不能保证取得好成绩。
6. 在这门课上取得好成绩对我来说是现在最满意的事情。
7. 对我而言，目前最重要的是提高我的整体平均成绩，因此我上这门课的主要目的就是取得好成绩。
8. 如果可以的话，在这个班上，我想取得比大多数同学更好的成绩。
9. 我想在这门课上取得好成绩，因为向家人、朋友、老板或其他人展示我的能力很重要。
10. 我想我可以把在这门课上学到的东西，学以致用用到其他课上。
11. 学习这门课的教材内容对我来说很重要。
12. 我对这门课的内容很感兴趣。
13. 我觉得这门课的教材内容对我很有用。
14. 我喜欢这门课的主题。
15. 理解这门课的主题对我很重要。
16. 当学习这门课时，我经常感到自己很懒惰或很无聊，以至于我在完成计划的学习前就退出了该课程。
17. 即使我不喜欢我们正在做的事情，我也会在这门课上努力学习。
18. 当功课很难时，我选择放弃或只做简单的部分。
19. 即使教材枯燥乏味，我也努力学完。
20. 学习这门课时，我经常试着向同学或朋友解释这些教材内容。
21. 我试着和同班同学合作，一起完成功课。

22. 在努力学习的同时，我经常抽出时间与同班同学讨论教材内容。
23. 即使我在学习这门课时遇到困难，我也尝试独立完成功课，而不是寻求帮助。
24. 我会让老师解释我还没明白的概念。
25. 当我无法理解这门课的教材内容时，我向班上的一名同学寻求帮忙。
26. 我试着找出班上的同学们，如有需要，我可以向他们求助。
27. 请提供你对使用“雨课堂”学习英语进行评价（感想，意见，或建议）。
28. 你的专业是什么？
29. 请选择你的年级。
 - 大一
 - 大二
 - 其他（请指明）
30. 请选择你的性别
31. 请填写你的年龄
32. 如果你对后续的研究内容感兴趣，请留下你的联系方式

Appendix C

Interview Questions

1. Could you please show me the pictures you took during the class activities?
2. Could you please explain the content of the pictures one by one and tell me why you took them?
 - i. What is your experience of mobile learning with this picture?
 - ii. What do you think of this mobile-assisted activity? Is it effective or not?
3. Through doing these activities, what do you think of your engagement in *College English* class?
 - i. How did your motivation for learning English get changed?
 - ii. How did your active learning get changed?
4. Do you think these activities enhance collaboration among students and how?
5. Do you think these activities enhance interaction between students and the instructor and how?
6. Do you use mobile devices for independent learning? How and when do you use it?
7. Do you have anything else to share?

Appendix D

Interview Questions in Chinese

1. 请给我看看你在课堂活动中拍的照片好吗？
2. 能否请你一一介绍图片的内容，并告诉我为什么要拍摄这些图片？
 - 1) 你介绍这张图中你所进行的移动学习体验。
 - 2) 你如何看待这种移动设备辅助学习英语的活动？效果如何？
3. 通过这些活动，你觉得你在大学英语课上的参与怎么样？
 - 1) 你学习英语的动机有什么变化？
 - 2) 你主动学习情况有什么变化？
4. 你认为这些活动是否加强了学生之间的合作？如何加强？
5. 你认为这些活动是否加强了学生与教师之间的互动？如何加强？
6. 你是否使用移动设备进行自主学习？你如何以及何时使用它？
7. 你还有什么要分享的吗？

Appendix E

Certificate of Ethics Clearance for Human Participant Research



Brock University
Office of Research Ethics
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

Social Science Research Ethics Board

Certificate of Ethics Clearance for Human Participant Research

DATE: 12/21/2020
PRINCIPAL INVESTIGATOR: COLLIER, Diane - Educational Studies
FILE: 19-161 - COLLIER
TYPE: Ph. D.
TITLE: Mobile Devices as an Engagement Tool for Post-secondary English as a Foreign Language Learning in China

ETHICS CLEARANCE GRANTED

Initial Clearance Date: 1/21/2020

Type of Clearance: RENEWAL

Expiry Date: 12/1/2021

The Brock University Social Science Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement.

Renewed certificate valid from 12/21/2020 to 12/1/2021.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 12/1/2021. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Office of Research Ethics web page at:
<https://brocku.ca/research-at-brock/office-of-research-services/research-ethics-office/#application-forms>

In addition, throughout your research, you must report promptly to the REB:

- Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
- New information that may adversely affect the safety of the participants or the conduct of the study;
- Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved:

Angela Book, Chair
Social Science Research Ethics Board

Dipanjan Chatterjee, Chair
Social Science Research Ethics Board

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the PI to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.