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Status and Trends of Mobile Learning in English Language Acquisition: A Systematic Review of Mobile Learning from Chinese Databases

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Abstract: Mobile learning has become the potential for innovation and disruption in the last decade. This study reviewed Chinese scholarly publications related to mobile learning research and published related to teaching and learning English in China's higher education. Its purpose is to enrich systematic reviews for digital education with the provision of mobile learning research in China's context with academic findings inaccessible to those who do not speak Chinese. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) principles are used to provide a transparent synthesis of extant studies. Major findings include that English learning has made progress in teaching strategy, pedagogical practice, and teaching model related to mobile technology, but a concern emerges in how teachers integrate technology into pedagogy appropriately to achieve the outcome beyond traditional teaching. The findings suggest further studies to analyse teachers' needs in disruptive education in China.

Keywords: mobile learning, English as a Foreign Language, China, higher education, systematic review.

Highlights

What is already known about this topic:

- Mobile learning has been used to investigate the effectiveness of mobile devices for enhancing learning experience and pedagogies to support teaching in distance education.
- A paucity of systematic reviews printed in English to provide scholars information on studies published in Chinese journals.
- Mobile learning has become the most widely research issue in exploring English teaching and learning with mobile technology for school education in China.

What this paper contributes:

- This systematic review ameliorates the gap of the scholarly work published in Chinese on mobile learning and English language acquisition. This work is typically inaccessible to scholars who do cannot speak/read Chinese. Systematic reviews published in English often have a Western focus and does not include a wider view.
- This study explicates how mobile learning is being used to enhance English language acquisition for those in Chinese higher education.
- This study provides an aggregated synthesis of mobile learning research published in Chinese journals accompanied with an analytical summary of the data.

Implications for theory, practice and/or policy:

- Wider access to findings about research in English acquisition related to teaching strategy, pedagogical practice, and teaching models from non-English speaking countries.
- Distance Education with mobile technologies has been mainly utilised and encouraged in practice.
- Practitioners can benefit from pedagogical practice and research using mobile devices highlighted in this study to achieve English acquisition in non-English speaking countries.

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- Digital education needs further study to formulate aligned curriculum, assessment of mobile learning and evaluation system for formal and informal settings with a collaboration by educators from local, national, and international levels.
- Future research should focus on the needs of teachers for teaching digital natives, especially teachers with liberal arts backgrounds in non-English speaking countries to prepare for mobile teaching.

Introduction

China is promoting innovation in education characterised by digitalisation, network connectivity and smart technology (Du, 2017). The demographics of mobile learning users in China range from primary school children (ages 6-12 years) who use the technologies for extra curriculum study, to adults for professional learning. In 2010, China issued The Outline of the National Long-term Education Reform and Development Plan, which emphasised the role of mobile learning as the potential of innovation and disruption in digital education. Digital education has changed the traditional conceptualisation of education into ubiquitous dissemination and seamless learning environments.

The technological improvement of mobile devices makes learning involved with digital technology. Technical elements, such as digital gizmos and the internet connection, are the main components playing roles in the context of interactive learning (Briz-Ponce, Pereira, Carvalho, Juanes-Méndez, & García-Peñalvo, 2017). The process to learn, to think, to communicate is based on the interactive agents of technology to assist study and reflection (Van Rooyen & Marais, 2018). Mobile learning is widely used in English acquisition for the authentic context and native language resources (Demouy, Kan, Eardley, & Kukulska-Hulme, 2015). However, Crompton & Burke (2018) pointed out that mobile learning was investigated with a limited number in the studies of pedagogies and teaching practice. In addition, research should not be dichotomised into learning and technology. Learning, teaching and technology should be designed into integrated models for mobile pedagogy implementation across different contexts (Khaddage et al., 2015).Empirical evidence indicates that mobile learning has a positive effect on educational pedagogies and learning outcomes (Chang et al., 2018; Crompton & Burke, 2018; Ke & Hsu, 2015; Wu et al., 2012). Kearney et al. (2018) suggested teachers use mobile pedagogy to implement feasible disruption in education. In China, scholars (viz., Hu et al., 2018; Chajuan & Chunlei, 2015; Youmei et al., 2013; Shaoqing et al., 2011) explored theoretical and empirical research in terms of mobile learning development. However, existing research mostly are overviews of teaching and learning practice with mobile devices and only published in English language journals. China's mobile learning research and studies are mostly published in Chinese journals and are rarely translated. This creates a gap in scholarly knowledge for mobile learning scholars who do not speak or read Chinese. There may be strategies and pedagogies with mobile devices used in the China that could be helpful to English language learners from other countries. The purpose of this systematic review is to reveal mobile learning research trends, issues, challenges, and implications regarding English teaching and learning in China, broadening the global academic knowledge in this field.

Background

Mobile learning is learning that takes place with the affordance of technology with mobility (El-hussein & Cronje, 2010). Mobile learning is "learning across multiple contexts, through social and content interactions, using personal electronic devices" (Crompton, 2013a, p.4). Compared to traditional education, mobile learning excels in mobility and ubiquity (Aguayo et al., 2017). Mobile technology allows learners to be involved in authentic contexts and conduct learning in formal and informal settings (Hongzhi, 2020). With mobile devices, mobile learning is able to occur at learners' convenience in pervasive learning environments.

With characteristic of high portability, individually targeted design, unobtrusive availability, and intuitive self-study (Burden & Kearney, 2017; Daughtery & Berge, 2017), mobile learning transforms the traditional concept that education only occurred at a fixed place. With pervasive learning, mobile learning plays an essential role in potential transformative education in informal settings (Hall et al., 2020).

Mobile learning has been utilised in education with smartphones initially, and then with the advent of tablets with the larger screen real estate in 2010. It is widely used in educational contexts, such as nurse education (Chang et al., 2018), science education (Chen & Jing, 2020), mathematics education (Wanget al., 2020; Yingchun et al., 2019), as well as language learning (Shi et al., 2017; Sun et al., 2017). Mobile learning for language education has great potential due to its social interactivity, context sensitivity, connectivity, and individuality (Jie et al., 2020). Mobile learning provides native communicative environments, abundant authentic language resources and situated learning scenarios on learners' convenience. The features of mobile learning break the barrier of the second language acquisition that learners cannot be exposed to the target language environment, which achieves a complete language acquisition system for second language learners (Hu Jing, 2015; Yanchun, 2019).

Extant Systematic Reviews

Scholars have conducted reviewed studies on mobile learning research in the recent decade. Duman et al. (2014) highlighted the development of mobile-assisted language learning in teaching language by reviewing published studies listed in SSCI (Social Sciences Citation Index) from 2000 to 2012. The result showed that teaching vocabulary for second language is popular with mobile devices. Krull & Duart (2017) studied the trends of mobile learning research in tertiary education ranged from 2011 to 2015 Based on the systematic review, they highlighted an increasing variety of research topics, methods and contexts using mobile learning for higher education and pointed out the needs for improving pedagogy. Systematic review was conducted by Crompton & Burke (2018) in studying mobile learning in higher education across 2010–2016 regarding research purposes, outcomes, subject matter domains, devices etc. The conclusion is that more than 70% of college students use mobile learning to extend their learning, and mobile learning has exceeded half of formal activities. Kaliisa & Picard (2017) conducted a systematic review of mobile learning in higher education in the context of African countries, highlighting large scales of mobile learning for improving pedagogical skills in institutions. These studies revealed current research on mobile learning from different perspectives. However, little systematic research touched down the status of mobile learning and its research trends in China's context. This study aims to enrich systematic reviews by reporting mobile learning in China to unfold the panorama of potential digital education around the globe.

Mobile Learning and Language Acquisition in China

Researchers in China appear to begin the study of mobile learning in early 2000. Inputting "mobile learning" as keywords in the index searching of Chinese National Knowledge Infrastructure (CNKI), a Chinese nationwide electronic database, there are 7,183 results retrieved by the end of 2019. The earliest exploration is on how to make use of mobile phones as a practical tool to learn English in 2003. Research on mobile learning dramatically increased after 2013 with the highest index searching of 1,258 results in 2017, and in 2020 as of July it is 2,397 results, which indicates that mobile learning has become a popular research topic in China.

Prior Chinese mobile learning research examined the topics of prospect, practice, design, and pedagogy in the early time of mobile learning study (Ling, 2005; Xiaoqiao et al., 2004); analysed characteristics, applications, theme-based study, and students' reflection in the evolvement (Lifang, 2012; Xiaoqiang, 2007); studied the factors of online learning, need analysis, teachers' professional development in the development period (Pengzhan et al., 2014; Tian & Ying, 2019; Xuefei & Juan, 2015).

Purpose

However, it appears that existing studies lack a comprehensive, consistent, systematic review to summarise mobile learning research in China. Scholars (viz., (Crompton & Burke, 2018; Crompton et

al., 2016; Pimmer et al., 2016) have highlighted this across past systematic reviews, noting that there is a gap in scholarly knowledge as only journals published in English are considered for systematic reviews. This study ameliorates that gap. In this systematic review, 438 articles have been analysed from extant research publication from 2008 to 2019, which period is the upsurge of mobile learning development in education. The time span is the boom of mobile learning combined with higher education. There are very few mobile learning articles before 2008 as this filed was only just emerging during this time. The studies have been retrieved from the database of CNKI (https://www.cnki.net/), to look at how mobile learning is developed for teaching and learning English in China's higher education.

This study proposes the main question: What is the status of scholarly studies about mobile Learning in English Acquisition from China's Database? Three sub-questions guide this study:

1. What are the themes in mobile learning research?
2. What are the research trends and research issues of mobile learning in China?
3. What are the challenges in using mobile learning to promote English teaching in China's higher education?

Methodology

A systematic review is the compilation of systematic methods to collect secondary data, appraise and synthesise current studies related to specific research (Petticrew & Roberts, 2006). It is intended to provide a comprehensive and exhaustive summary of current literature relevant to the research question (Xiao & Watson, 2019). This review is guided by the addressed question "what is the research status and trends of mobile learning in China's higher education?", then three researchers collected literatures screened by the key words with reference to mobile learning regarding English teaching and learning in China's higher education. Data was identified and selected by the Inclusion and Exclusion Criteria using PRISMA criteria (Moher et al., 2009) to provide transparency and reduce researcher bias.

Search Strategy

The study started with an extensive search with searching index related to educational technology in CNKI for the secondary data of Chinese publications from 2008 to 2019. Journals were searched with the theme relevant to the term "mobile learning" (similar expression inclusive of "educational technology", "digital education", "digital learning", "E-learning"), and to ensure a level of quality, selected based on the h-index of the journal. Top-ranked journals related to educational technology, named CSSCI (Chinese Social Science Citation Index) journals, were listed based on h-index in 2019. Table 1 displays the top eleven journals.

Table 1. Rank Chinese Journals Related to Educational Technology.

Rank	Journal
1	China Educational Technology
2	Open Education Research
3	Modern Educational Technology
4	Research in Higher Education of Engineering
5	E-Education Research
6	Modern Distance Education Research
7	Distance Education in China
8	Journal of the Chinese Society of Education
9	Technology Enhanced Foreign Language Education
10	Modern Distance Education
11	Theory and Practice of Education
12	Modern Electronics Techniques

From the above 12 journals, the keywords “mobile learning,” or “E-learning”, or “disruptive education” and “higher education,” and “English”, which are widely used vocabulary in Chinese to define English learning with mobile technology, were searched with electronic index searching. Fifteen results from 2008 to 2019 showed up. Journal publications are limited in such a small number because the publication in CSSCI journals is severely competitive. Therefore, in this systematic review, articles were selected from all the journal publications collected in CNKI without the specific requirement of h-index; hence, this systematic review presented the snapshot of all the mobile learning research published in China.

Research Selection

The time range of research selection was from the year 2008 to 2019, which is the fast-developing stage of mobile learning in China’s education (Murphy & Dyson, 2017). A large number of studies and publications were published between the year 2013 to 2019 when mobile learning became more widespread with the ubiquitous accessibility to smartphones (Crompton, 2014; Traxler, & Crompton, 2020). Mobile learning is recognised by learners and educator teachers because of the rapid development of mobile technology and unlimited access to the internet. The readable screen, easy access to the website, rich resources on social media, all contribute to the increase of mobile learning. From 2008 to 2019, the initial search with keyword “mobile learning” (same as above) located 7,183 results, then indexed with the term “mobile learning”, and “English”, and “higher education” showed up 512 results, among which 74 were thesis. The remaining 438 were further assessed to make sure that they met the requirement of inclusion criteria to do research (shown in Figure 1). Besides, the publications were required to be original and relative.

Inclusion and exclusion criteria

The criteria of inclusion and exclusion of this research is classified in Table 2. In this systematic review, all the data matches the inclusion criteria and the exclusion criteria. These 438 articles were reviewed by three independent researchers, keeping in view of the inclusion and exclusion criteria, resulting in interrater reliability of 97.5%. Table 2 represents the inclusion and exclusion criteria.

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Students use mobile devices to study English	Computers are excluded from mobile devices
In higher education settings	Learners outside of China are not included
Articles are original research	H-index is not included
Articles are peer-reviewed among three independent researchers.	
Articles are all published and included in CNKI.	
Articles are not required in the top eleven journals listed in Table 1.	
Results are created based on the searching result of CNKI.	

Figure 1 represents the PRISMA search with review procedure.

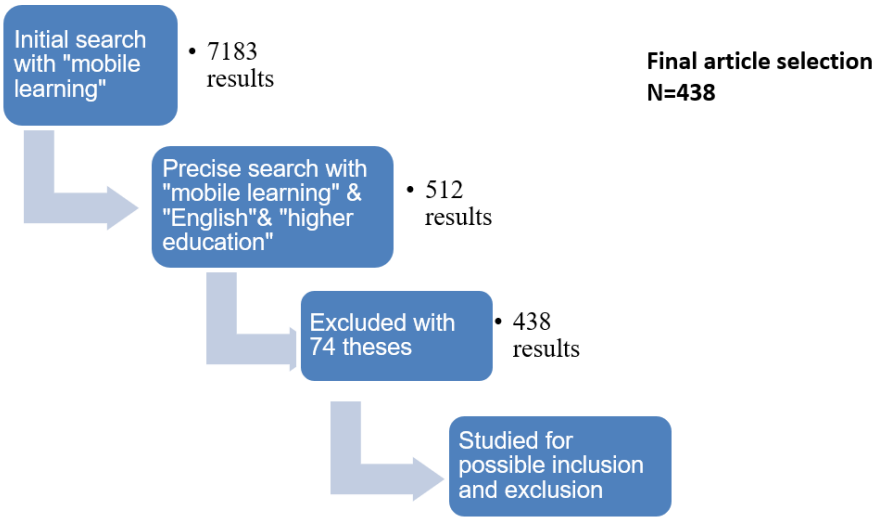

Figure 1. The literature search and review process

The Electronic Database

CNKI is a national information project, which aims to publicise original research, share knowledge resources, and disseminate the frontier of edge knowledge in China. Tsinghua University and Tsinghua Tongfang Co. Ltd are two main institutions to initiate CNKI from June 1999.

The researchers chose CNKI to conduct the research selection based on two reasons. First, CNKI is the most influential electronic database in China. It collects all the Chinese publication in journals, newspapers, and conferences, representing the full vision of mobile learning research in China. Second, compared to Web of Science, EI, Scopus, or other international databases, all these require a good command of English writing, ignoring valuable research writing in Chinese.

Coding

After the data aggregation, 438 studies were identified for the review. Open coding was conducted by three researchers to ensure the objectivity and reduce the bias (Mills, Bonner, & Francis, 2006). The research elements were listed as: 1) status, 2) trends, 3) issues, 4) challenges, 5) subject area. Deductive strategies were adopted in the code development and comparison (Hennink, Hutter, & Bailey, 2020). From the 438 studies, the status of mobile learning research, research trends, emergent issues and challenges were coded to identify the status of mobile learning research as well as existing issues and challenges. Subject areas were coded into research domains related to mobile learning as educational theory, learning management system, blended learning design, software, and application.

To avoid bias, three researchers worked independently to code the research elements. This led to a 90% agreement. The researchers met in a discussion on the differences and reached a 100% agreement. In the coding process, the data was preserved with the context and original meaning for conducting the secondary analysis.

Findings and Discussions

From the coding of mobile learning status, three codes were extracted: 1) Examining the theme of mobile learning research. Studies in the section appraised this research purpose of mobile learning. 2) Accessing the research conducted in mobile learning from 2008 to 2019. Studies in this part explored

the subject of mobile learning in the last ten years. 3) Investigating the challenges of Chinese mobile learning. Studies in this sector assessed the difficulty and opportunity for mobile learning in China.

Themes of mobile learning research

The theme classification of mobile learning from 2008 to 2019 is represented in Table 3, which shows that mobile learning is the leading research area, followed by College English and mobile devices.

Table 3. Theme classification of mobile learning in China

Theme	Number of studies
Mobile learning	193
College English	86
Mobile devices	66
Apps (e.g., WeChat)	34
Learning styles	23
Teaching model	21
Others	15

Mobile learning became the popular topic with the development of educational technology from 2000s. The earliest study of mobile learning in China was found in 2003 by Liang Haili, who published an article discussing the possibility of studying English with the function of smartphones (Liang, 2003). In early stage (2008-2012), research was mainly about technological factors in attempting teaching practice. Discussions concentrated on the design of developing mobile technology to enhance learning (Lei et al., 2008), exploring online platform construction in open online education (Wang et al., 2009), English learning with mobile phones (Jia, 2010), and application of mobile learning in higher education (Shaoting & Mingjiao, 2009). Empirical research on the integration of mobile technology in distance English teaching shows the potential of mobile learning in future English learning (Lifang, 2012).

In the evolving stage (2013-2016), studies focused on blended learning, as mobile learning combined with teaching College English (Songbin, 2013), context-awareness in learning English as a foreign language (Xiaodong & Hong, 2013), teaching design of mobile learning model to enhance teaching and learning (Jianqiang, 2014), flipped class practice in English teaching (Hu Jing, 2015), and strategies in learning English with social media (Ning, 2016).

In late years (2017-2019), research themes were various and multi-perspective, as exploring strategies in improving English skills (Fuxian & Xiaoying, 2017), blended teaching model with online and offline teaching (Xiaodong & Baoyun, 2017), teachers' perceptions and learners' expectations (Min & Ruo, 2018), English teachers' role in teaching with mobile learning (Tian & Ying, 2019).

Summarised from the review, at the beginning of mobile learning, studies emphasised on exploring the possibility of mobile learning in education as well as technical support to assist learning. In the developing stage, studies turned to exploring teaching models, learning designs along with the outcome and effectiveness of blended learning. In late years, emphasis was paid on needs analysis, teacher's perceptions, learner's expectations, and educators' sustained training support. This result corroborates with Krull & Duart (2017) that mobile learning was dramatically increased in researching a variety of topics of higher education. It is easily seen that the research of mobile learning goes through a period of attempting practice, then booming in prosperity with teaching practice and learning design, and now it is inclined to the research of human behaviour as teacher's cognitive perceptions and learners' expectations.

Research Trend

The research of mobile learning developed rapidly from 2013 to 2019, during which was the popularity of smartphones and extensive coverage of the internet. Figure 2 shows the upsurge of annual publication from 2008 to 2019.

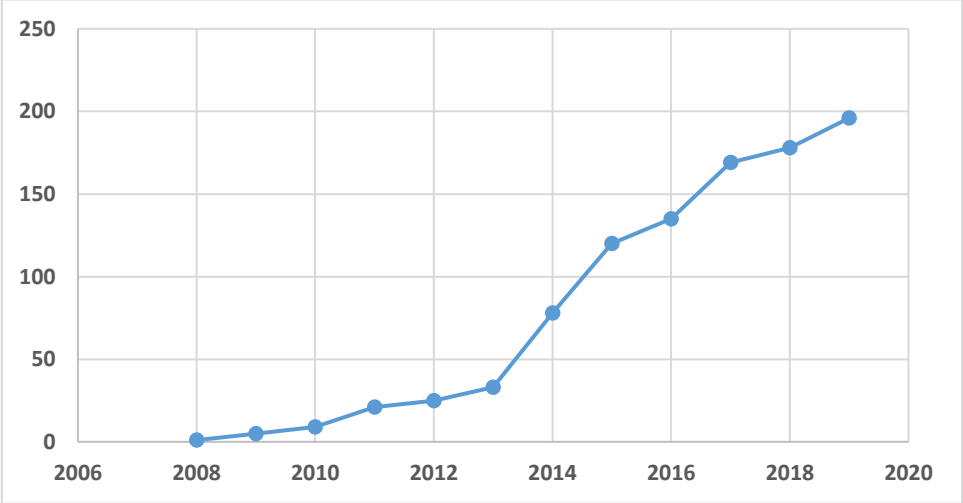

Figure 2. Annual Publication of Mobile Learning from 2008 to 2019

From 2008 to 2013, the research publication of mobile learning is increasing steadily. After 2013, mobile learning research soared quickly, which was the result of rapid growth of smartphones. Mobile learning became a useful autonomous learning model for students to enhance their learning experience (Chen, 2013). The characteristic of mobile learning, such as contextual interactions, social connectivity, and flexible settings, contributes to its popularity with English learning in China.

Mobile learning studies explored pedagogical practice in teaching English with mobile devices in higher education. English education in China is facing the dilemma of no apparent improvement in teaching English in universities. One typical consequence is that learners have difficulties speaking English in international circumstances (Jigang, 2017). Therefore, English education in China encourages the pedagogical practice of teaching English with mobile technology. Figure 3 shows the research area distribution in mobile learning.

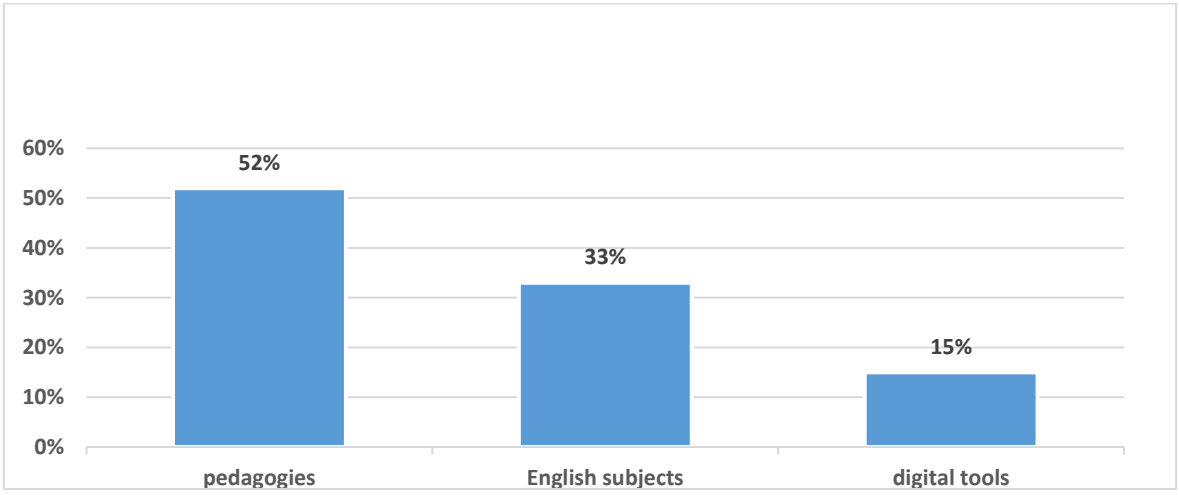

Figure 3. Research Area Distribution

From Figure 3, the exploration of mobile learning for pedagogical practice made up for the largest portion in research area, followed by English subjects, referring to the specific English skills as listening,

reading, vocabulary. Last is the research of digital tools used in mobile learning, accounting for 15 percent. Figure 3 showed that mobile learning played an important role in teaching English. This result showed that the implementation of mobile learning in China's higher education requires urgent pedagogical innovations to improve English teaching and learning, which is a little different with Crompton (2018). This is due to China's "Internet plus education" policy for improving teaching through digital technologies; therefore, pedagogy with mobile technology accounts for a large proportion of research in China.

Research issues

The utility of mobile learning in China is mainly about the enhancement of English teaching and learning as shown in Figure 4. In the selection of 438 articles, 403 were about the exploration of practising blended English learning, 232 about the discussion of educational theory and management for guiding and conducting mobile education, 60 about software and application adopted in mobile learning. Among these publications, the subject was overlapped. For example, Ning (2016) explored the soft application on how to improve English study, which was categorised in the blended English learning as well as in software and application.

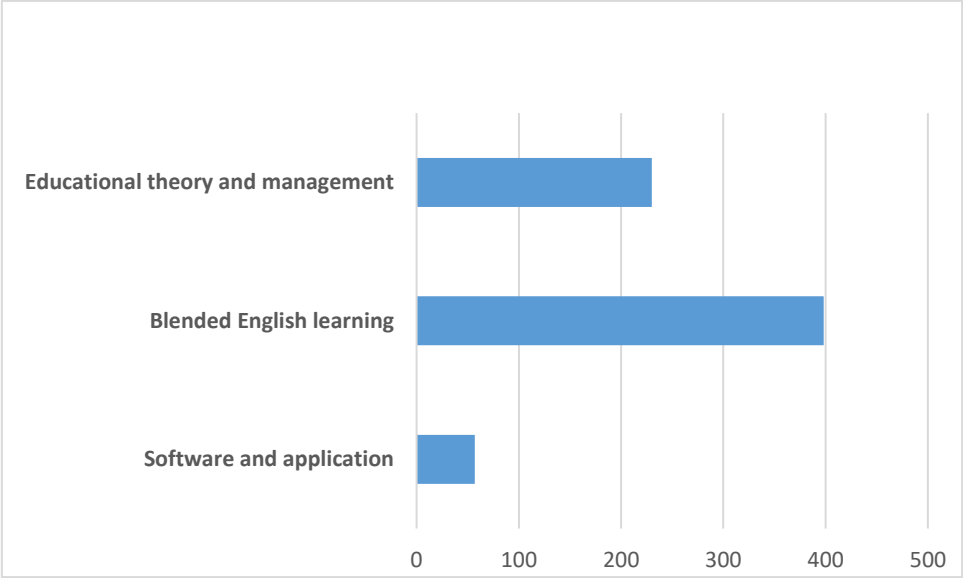

Figure 4. Research Issue

Figure 4 shows the distribution of research issues of mobile learning. Blended English learning is the most discussed topic, which explored blended teaching and learning potentials aided by mobile technology, followed by educational theory and management. Educational theory and management are summarised in the same category because the theories are mainly about how to use mobile learning management to achieve the teaching and learning outcome with education theoretical support. Software and application are mainly about how to use social media and apps to implement mobile learning. Teachers' attitudes, students' attitudes, and teachers' professional development are not listed as items in the figure because these aspects are closely connected to the context of mobile technology and thus categorised under the above issues.

Challenges

Mobile learning is facing challenges with its growing demand in late years. The blurred role of teachers (Tian & Ying, 2019) in teaching model as small private online class and flipped class (Xudan, 2017), the professional development of English teachers in mobile learning (Shuang & He, 2018), teachers' attitudes and learners' expectation (Hongbo, 2018; Yang, 2018), the evaluation of learning outcome (Fuxian & Xiaoying, 2017) all demand further investigation on the challenges initiated by mobile learning.

Based on the systematic review, the emergent challenges are divided into three classifications. The first challenge is teacher's professional development. Mobile learning, as the essential activity in digital education, has higher requirements for technical skills in designing a blended teaching model. Teachers with little technical background lack confidence to apply mobile learning in their classes. Yang (2018)) investigated English teacher's confidence and concluded that the enhancement of intersected knowledge was vital to improve teacher's confidence in the digital era. Yanchun (2019) confirmed the positive role of technical education, but he pointed out that teachers should bear teaching reflections on how to integrate technology in their career. Teachers are expected to get prepared for the pedagogies ready for digital education.

The second challenge is how to use mobile learning to enhance students' learning experience. Research showed the effect of enhancing learning with mobile technology, but the outcome is not beneficial to show the advantage beyond traditional education. Miao (2016) discussed the strategy to use social media such as WeChat, an instant communication app, to improve English learning, but found the outcome was not effective as expected (Ning, 2016). Vocabulary study was practiced in the context of mobile learning, but students showed little improvement (Lifang, 2012). The positive role of mobile learning is approved by most research. However, the beneficial effect is determined by the effort of individual students, and the overall learning outcome is difficult to evaluate. Mobile learning helped students to learn English in their convenience; nevertheless, the learning process is uncontrollable, and the outcome is difficult to assess (Chajuan & Chunlei, 2015).

The third challenge is blended teaching models. Wu (2014) agreed with the positive effect of MOOC (massive open online courses) and flipped class, predicting that blended learning may lead to potential education in future (Jiehui & Zhongjie, 2014). Hu (2015) and Fu (2016) investigated flipped class model in teaching college English, pointing out that blended learning needed more practice and support (Hu Jing, 2015; Xuexi, 2016). More research is needed on how to blend mobile learning to achieve outcomes from mobile learning strategies, designs, and practice, mobile learning is hitherto at the exploratory stage.

The finding showed that mobile learning played a positive role in China's higher education, which is consistent to Kaliisa & Picard (2017), who highlighted the use of mobile learning in institutions to improve pedagogical skills Nevertheless, the learning outcome of mobile learning was not significant with the current teaching model and strategies. Educators need exertion and collaboration to improve specific skills in enhancing teaching practice using mobile learning in online and offline settings.

Limitation

This systematic review provides dimensional research of mobile learning published in Chinese journals collected by CNKI in one decade. There are other publications that publish in Chinese, but this work only focuses on articles within CNKI. Furthermore, this study selected articles published in Chinese to select and evaluate and excluded articles in other languages. Therefore, this work may only represent the research trends of mobile learning in China's scope, and this work cannot be generalised globally or to specific Western Countries.

Identified Gap and Future Research

During this systematic review, the data reveal gaps in academic knowledge in the use of mobile learning in English language acquisition in China. One of the main gaps, which this systematic review ameliorates is the lack of access to Western scholars from accessing studies published in Chinese. Systematic reviews, such as this one provides insight, but it would be helpful for systematic reviews to present other

similar systematic review on mobile learning in other disciplines and other forms of technology that support English language acquisition.

In addition, from the articles examined in this study, it appears that English education in China focuses on aligning technical skills with pedagogical practices. It would be prudent for future researchers publishing in Chinese journals to take a deeper look at what is happening with the learner and their experiences.

This research implied two implications. First, future study should concern about teachers' needs in digital education. English teachers with liberal arts background are in urgent need to get ready for mobile pedagogy (Ailing, Lu, Yao, Yangchun, & Si, 2018). Second, teachers are encouraged to adopt mobile technology to innovate teaching. However, the aligned curriculum, assessment of mobile learning, appraisal of teachers' work in mobile settings are not mentioned in the research. These should be explored to standardise the criterion of mobile learning outcome.

Conclusion and suggestions

This systematic review provides a complete prospect of mobile learning research from 2008 to 2019 in China's higher education. It discussed the research trends, issues, and challenges. In this systematic review, 438 articles were analysed to evaluate the eleven-year period of extant research of mobile learning development in China. The result showed that mobile learning increased rapidly in the last decade, with research focus from the attempt to use mobile learning to enhance English teaching and learning to the widely pedagogical practice in improving English in formal educational settings. Rapid progress has been made in teaching strategies, pedagogical practice and teaching model. Nonetheless, the recent research focus is inclined to improve the efficacy from educators and learners' perspectives. A concern emerges that teachers need to integrate technology appropriately to achieve positive outcome.

This study shows that teachers have not yet utilised teaching practice for mobile learning. Technology enhanced learning experience, but it created challenges for teachers to innovate pedagogies with technologies. Teachers' concept is going through a pedagogical reform with the use of mobile technologies. To achieve this, teachers have to accept the challenges to update knowledge with educational technology, meanwhile, institutions and policymakers need to provide sustained support for teachers in terms of technology and professional development. Further study is suggested to explore pedagogical and technological support based on empirical research.

Mobile learning knotted a close connection between technology and education in the digital era. This systematic review is significant in providing mobile learning research for English teaching and learning in non-English speaking countries. Education is varied in geographical disparity and regional economic differences. Hence, mobile learning is an ideal way to achieve resource allocation among different regions. This systematic review reflects the phenomenon and enriches the studies of English acquisition with mobile technology.

References

Aguayo, C., Cochrane, T., & Narayan, V. (2017). Key themes in mobile learning: Prospects for learner-generated learning through AR and VR. *Australasian Journal of Educational Technology, 33*(6), 27–40. https://doi.org/10.14742/ajet.3671

Ailing, Q., Lu, W., Yao, L., Yangchun, Y., & Si, C. (2018). Research on Differences of Teaching Behaviors of Different Teacher Groups. *E-Education Research, 30* (4), 93–101. https://doi.org/10.13811/j.cnki.eer.2018.04.014

Burden, K. J. J., & Kearney, M. (2017). Investigating and critiquing teacher educators' mobile learning practices. *Interactive Technology and Smart Education, 14*(2), 110-125. https://doi.org/10.1108/ITSE-05-2017-0027

Chajuan, H., & Chunlei, S. (2015). Analysis and reflection on Mobile learning to study English in China. *Distance Education in China*, 12(3),15-21. https://doi.org/10.13541/j.cnki.chinade.2015.10.004

Chang, C. Y., Lai, C. L., & Hwang, G. J. (2018). Trends and research issues of mobile learning studies in nursing education: A review of academic publications from 1971 to 2016. *Computers and Education, 116*, 28–48. https://doi.org/10.1016/j.compedu.2017.09.001

Chen, L., & Jing, Y. (2020). Design of mobile learning platform based on deep learning. *Modern Electronics Technique, 21*(1), 1–9. https://www.golder.com/insights/block-caving-a-viable-alternative/

Crompton, H. (2013). A historical overview of mobile learning: Toward learner-centered education. Handbook of mobile learning, 3-14.

Crompton, H. (2014). A diachronic overview of mobile learning: A shift toward student-centered pedagogies. In M. Ali & A. Tsinakos (Eds.), *Increasing access through mobile learning* (pp. 7-16). Commonwealth of Learning Press.

Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers and Education, 123*, 53–64. https://doi.org/10.1016/j.compedu.2018.04.007

Crompton, H., Burke, D., Gregory, K. H., & Gra, C. (2016). The Use of Mobile Learning in Science: A Systematic Review. *Journal of Science Education and Technology*, 25(2), 149-160. https://doi.org/10.1007/s10956-015-9597-x

Daughtery, C., & Berge, Z. L. (2017). Mobile Learning Pedagogy. *International Journal for the Scholarship of Technology Enhanced Learning,* 111–118. http://hdl.handle.net/11603/16047

Du, Z. (2017). Address at the 2017 International Forum on ICT and Education 2030. http://www.unesco.org/new/en/media-services/single-view/news/international_forum_on_ict_and_education_2030_opens_in_qingd/.

Duman, G., Orhon, G., & Gedik, N. (2014). Research trends in mobile assisted language learning from 2000 to 2012. *ReCALL, 27*(2), 197–216. https://doi.org/10.1017/S0958344014000287

El-hussein, M. O. M., & Cronje, J. C. (2010). Defining Mobile Learning in the Higher Education Landscape. *Educational Technology & Society, 13*(3), 12–21. https://doi.org/101.203.171.2

Fuxian, L., & Xiaoying, L. (2017). On the Effects of Enhancing Strategies in Mobile Learning of College English Vocabulary. *Journal of Guangdong University of Foreign Studies, 28*(6), 73-79. https://en.cnki.com.cn/Article_en/CJFDTotal-GDWY201706021.htm

Hall, T., Connolly, C., Ó Grádaigh, S., Burden, K., Kearney, M., Schuck, S., … Kosmas, P. (2020). Education in precarious times: a comparative study across six countries to identify design priorities for mobile learning in a pandemic. *Information and Learning Science, 121*(5–6), 423–432. https://doi.org/10.1108/ILS-04-2020-0089

Hennink, M., Hutter, I., & Bailey, A. (2020). *Qualitative research methods.* SAGE Publications Limited.

Hongzhi, N. (2020). *Investigation on the Current Situation of Mobile Learning in College English: An Empirical Study of LongDong Institute.* Modern Communication. 14, 198-200. https://mall.cnki.net/magazine/Article/XKJJ202014095.htm

Hu Jing. (2015). Study on Mobile Learning in College English Flipped Classroom Teaching Model. *Research on Higher Education of Nationalities, 13*(3), 78–82. https://doi.org/10.14045/j.cnki.rhen.2015.03.014

Jia, Q. (2010). A brief study on the implication of constructivism teaching theory on classroom teaching reform in basic education. *International Education Studies, 24*(2), 197–200. https://doi.org/http://dx.doi.org/10.5539/ies.v3n2p197

Jian, F., & Xue, Y. (2009). A 10-year Overview of Domestic Research and Practice of Mobile Learning. *China Education Technology, 270*(7), 36–41.

Jianqiang, X. (2014). Research on Construction and Development of M-learning mode of College English. *Experimental Technology and Management, 31*(3), 40-45. https://doi.org/10.16791/j.cnki.sjg.2014.03.049

Jie, Z., Sunze, Y., & Puteh, M. (2020). Research on Teacher's Role of Mobile Pedagogy Guided by the Zone of Proximal Development. In Proceedings of *the 2020 9th International Conference on Educational and Information Technology* (pp. 219–222). https://doi.org/10.1145/3383923.3383965

Jiehui, H., & Zhongjie, W. (2014). An Empirical Study on the MOOC-based College English Flipped Classroom Instructional Model. Technology Enhanced Foreign Language Education, 160(11), 219–227. https://doi.org/10.3969/j.issn.1001-5795.2014.06.006

Jigang, C. (2017). Review of Chinese Tertiary English Education:Failure and Lessons. *Journal of Northeast Normal University (Philosophy and Social Sciences), 289*(5), 59-66. http://doi.org/10.16164/j.cnki.22-1062/c.2017.05.001

Ke, F., & Hsu, Y. C. (2015). Mobile augmented-reality artifact creation as a component of mobile computer-supported collaborative learning. Internet and Higher Education, 26, 33–41. https://doi.org/10.1016/j.iheduc.2015.04.003

Kearney, M., Burden, K., & Schuck, S. (2018). Disrupting Education Using Smart Mobile Pedagogies. *Didactics of Smart Pedagogy: Smart Pedagogy for Technology Enhanced Learning*, 139–157. https://doi.org/10.1007/978-3-030-01551-0_7

Krull, G. E., & Duart, J. D. (2017). Research trends in mobile learning in higher education: A systematic review of articles (2011-2015). *The International Review of Research in Open and Distributed Learning, 18*(7), 1–23. https://doi.org/10.19173/irrodl.v18i7.2893

Kukulska, A., Sharples, M., Milrad, M., Kukulska-Hulme, A., Sharples, M., Milrad, M., … Vavoula, G. (2009). Innovation in Mobile Learning: A European Perspective. *International Journal of Mobile and Blended Learning, 1*(1), 13–35. https://doi.org/10.4324/9780203076095-10

Lei, L., Qiaorong, D., & Xiangzeng, M. (2008). Analysis of Developing Technology of one to one Digital Learning Software on Mobile Platform. *Modern Educational Technology, 18*(4), 95–98. https://doi.org/10.3969/j.issn.1009-8097.2008.04.022

Liang. (2003). Wireless and mobile technologies to enhance teaching and learning. *Journal of Computer Assisted Learning, 19*, 371–382. https://doi.org/10.1046/j.0266-4909.2003.00038.x

Lifang, Y. (2012). The Application of Mobile Learning to College English Vocabulary Learning. *Technology Enhanced Foreign Language Education, 146*(7). 54-58. https://doi.org/10.3969/j.issn.1001-5795.2012.04.010

Ling, Z. (2005). M-Learning:based on Short Message Service of Mobile Phone. *Modern Educational Technology, 15*(5), 36–41. https://doi.org/10.3969/j.issn.1009-8097.2013.02.001

Mills, J., Bonner, A., & Francis, K. (2006). The Development of Constructivist Grounded Theory. *International Journal of Qualitative Methods, 5*(1), 25–35. https://doi.org/10.1177/160940690600500103

Min, L., & Ruo, H. (2018). A Study on Adult Learners Needs of English Mobile Learning Resources. *Contemporary Continuing Education, 36*, 14-19. https://doi/org/10.3969/j.issn.2095-5510.2018.01.004

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Altman, D., Antes, G., Tugwell, P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7).11-18. https://doi.org/10.1371/journal.pmed.1000097

Ning, M. (2016). English Mobile Learning Strategies in Universities and Colleges based on WeChat. *Instruction and Teacher Professional Development, 350*(3), 136-140.

Pengzhan, Y., Zhongpeng, L., Yongci, L., & Junying, P. (2014). Online teacher training on Design research of micro learning resources. *China Educational Technology, 325*(2), 84-87. https://doi.org/10.3969/j.issn.1006-9860.2014.02.015

Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences.* Blackwell Publishing. https://doi.org/10.5860/choice.43-5664

Shaoqing, G., Jianjun, H., & Qingfei, Y. (2011). An Overview of Mobile Learning Development Abroad. *E-Education Research, 217*(5), 18–46. https://doi.org/10.13811/j.cnki.eer.2011.05.018

Shaoting, S., & Mingjiao, W. (2009). The Application of Mobile Learning Based on Smart Phone in higher education. *The Chinese Journal of ICT in Education,* 23, 80-83. https://doi.org/10.3969/j.issn.1673-8454.2009.12.029

Shi, Z., Luo, G., & He, L. (2017). Mobile-assisted Language Learning Using WeChat Instant Messaging State of art. *Journal of Emerging Technologies in Learning, 12*(02), 16–26. https://doi.org/10.3991/ijet.v12i02.6681

Songbin, B. (2013). M-learning Combined Teaching Model of College English. *Research and Exploration in Laboratory, 32*(4), 144-147. https://doi.org/10.3969/j.issn.1006-7167.2013.04.038

Sun, Z., Lin, C., You, J., Shen, H., Qi, S., & Luo, L. (2017). Improving the English-speaking skills of young learners through mobile social networking, *Computer Assisted Language Learning*, 30 (3-4), 302-324. https://doi.org/10.1080/09588221.2017.1308384

Tian, Y., & Ying, T. (2019). Analysis on College's English teachers' Role in Mobile learning. *Think Tank Era Journal*, 12(2), 67-71.

Traxler, J. & Crompton, H. (Ed.). (2020). *Critical mobile pedagogy: Cases of digital technologies and learners at the margins.* Routledge.

Wang, S., Yong, Q., & Xiaojun, R. (2020). Research on the Application of Mixed Teaching Mode Based on Rain Classroom - Taking "Mathematical Modeling Experiment" as an example. *Research and Exploration in Laboratory, 39(5),160-164.*

Wang, Y., Wu, M., & Wang, H. (2009). Differences in the acceptance of mobile learning. *British Journal of Educational Technology, 40*(1), 92–119. https://doi.org/10.1111/j.1467-8535.2007.00809.x

Wu, W. H., Jim Wu, Y. C., Chen, C. Y., Kao, H. Y., Lin, C. H., & Huang, S. H. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers and Education, 59*(2), 817–827. https://doi.org/10.1016/j.compedu.2012.03.016

Xiao, Y., & Watson, M. (2019). Guidance on Conducting a Systematic Literature Review. *Journal of Planning Education and Research.* 39(1), 93-112. https://doi.org/10.1177/0739456X17723971

Xiaodong, L., & Baoyun, W. (2017). An Empirical Study on College English Flipped Classroom Model Based on Context Awareness. *Technology Enhanced Foreign Language Education,* 12, 1–7. http://d.wanfangdata.com.cn/periodical/wydhjx201706011

Xiaodong, L., & Hong, Z. (2013). Research on English M-Learning Software on Context-awareness. *Modern Edcuational Technology, 23*(5), 36–41. https://doi.org/10.3969/j.issn.1009-8097.2013.02.001

Xiaoli, Z., & Peng, Z. (2006). Discussion on Curriculum and Teaching Design of Adult Mobile Learning. *Vocational and Technical Education, 27(16),58-60.* https://doi.org/10.3969/j.issn.1008-3219.2006.16.018

Xiaoqiang, M. (2007). Selection and Evaluation of Mobile Learning Terminal. *E-Education Research, 5, 52-57*. https://wenku.baidu.com/view/de98bafef705cc175527094f.html

Xiaoqiao, L., Lili, Z., & Li, W. (2004). Prospect of 3G Application in Mobile Learning. *Journal of Higher Correspondence Education, 17*(3), 6–8. https://doi.org/10.3969/j.issn.1006-7353.2004.03.001

Xiaoyong, H., Huayang, Z., Yi, L., Yan, Z., & Yan, Z. (2018). From "Innovation for Education" to "Education for Innovation": A Review of GCCCE2018 and Li Kedong Symposium on Academic Thoughts. *E-Education Research, 304*(8), 114–121. https://doi.org/10.13811/j.cnki.eer.2018.08.018

Xudan, Z. (2017). The role of teachers in SPOC teaching model. *The Chinese Journal of ICT in Education, 54(4),4-6*. https://www.fx361.com/page/2017/0325/1285190.shtml

Xuefei, S., & Juan, D. (2015). Survey and Research on Attitude of the Pre-service Teachers to Mobile Learning. *China Educational Technology, 341*(6), 104-109.

Xuexi, F. (2016). On the Teaching Innovation of College English based on "Class+ Mobile Learning" model. *Journal of Guangxi Normal University: Philosophy and Social Sciences, 52*(4), 140-144. https://doi.org/10.16088/j.issn.1001-6597.2016.04.021

Yanchun, C. (2019). Analysis of the current situation of college students using mobile APP to learn English. *Education Modernization, 12(6), 142-147*. https://doi,org/10.16541/j.cnki.2095-8420.2019.06.050

Yang, Z. (2018). The prospect of English teachers' professional development against TPACK Framework. *Heilongjiang Education, 12(*1), 11–14. https://www.cnki.com.cn/Article/CJFDTotal-HJLL2018Z1001.htm

Yingchun, S., Xinghua, L., & Guizhi, M. (2019). Research on the Teaching Reform of Advanced Mathematics in Mobile Learning. *Heilongjiang Education* (Theory & Practice). 24(4), 49-50. https://www.airitilibrary.com/Publication/alDetailedMesh?docid=hljjy-llysj201804023

Youmei, W., Juan, W., Xiaolan, Y., & Haiyan, W. (2013). Research Status and Future Trends of China's Mobile Learning in Recent 20 Years -A review based on the comparison between China and the West. *Modern Distance Education, 121*(1), 49–55. https://doi.org/10.3969/j.issn.1009-5195.2013.01.007

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