



World Conference on Technology, Innovation and Entrepreneurship

## MALL Revisited: Current Trends and Pedagogical Implications

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### Abstract

A need for the review of Mobile-Assisted Language Learning emerges to shed light on the future research to prepare, plan, design and integrate a mobile learning based pedagogical framework. This study aims to provide a general but recent outline of the research focusing on MALL with references to national (Başoğlu & Akdemir, 2010; Öz, 2014) and international studies (Liu & Chen, 2014; Hsu, Hwang & Chang, 2013). With the qualitative meta-analysis design, this study examines 32 selected MALL papers published between 2010 and first half of 2015. Database and citation search were performed limiting the keywords to MALL, while excluding the studies on m-learning. In addition to the existing meta-analyses on MALL (Burston, 2015; Duman, Orhon, & Gedik, 2014), as a follow-up, the findings reveal a skill-based language learning orientation with an emphasis on vocabulary and listening, followed by learning factors such as student perspectives, intention, acceptance and readiness to use new mobile technologies. New additions to MALL research include integration of social media, a link to language acquisition and the design of mobile applications.

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Peer-review under responsibility of Istanbul Univeristy.

*Keywords:* MALL; second/foreign language education; EFL /ESL; meta-analysis

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## 1. Introduction

Mobile device use for educational purposes, namely m-learning, as reported by Wu et al. (2012) show a tendency to focus on either effect or design studies with mostly positive outcomes and perceptions. As categorized in the same study, language and linguistics was the disciplinary area that integrated m-learning the most. In line with this finding, mobile-assisted language learning has point of interest in many aspects including skill-based effectiveness, readiness and adaptation and development of mobile learning system systems.

The shift in the technological device is clearly evident with limited modifications in challenges and applications. To exemplify, a paper of 2006 reports more common use of PDAs (Personal digital assistants) than cell phones with the major function of handheld translators and sees the small screen size a drawback to present a new content but an advantage to review and practice (Chinnery, 2006). Related to the today's mobile device preference, Solemani, Ismail and Mustaffa (2014) reported that students tend to use mobile phones compared to other devices such as tablet PC/PDA and iPod. Similarly, the focus group discussion conducted by Muhammed (2014) illustrates a similar pattern of preference among EFL university students. Accordingly the majority of papers investigated utilized mobile phones as the mobile device for language learning followed by tablet PCs (Savaş, 2014), iPods and MP3 players. Hence, the position of this study is to observe the use of technological tools, primarily mobile phones; to identify pedagogical factors in MALL implementations and to outline challenges and barriers referring to limitations.

## 2. Literature Review

- *From CALL to MALL*

Upon conducting studies on CALL and investigating its impact, researchers mostly determined favorable pedagogical implications for the use of computers in language education. The emphasis has long been on technology integration to meet the learning objectives particularly considering teacher and learner attitudes, acceptance, readiness and competence to use the technologies devices and to match these to the instructional goals. As a general framework of CALL studies based on skills, Stockwell (2007) analyzed the publications from 2001 to 2005 and pointed out the tendency to focus on grammar and vocabulary followed by pronunciation and reading. In a more recent study Tomakin and Yeşilyurt (2013) grouped the research conducted in Turkey between the years of 2002 and 2010 with focus on grammar, vocabulary, academic achievement and attitude. The study by He, Puakpong and Lian (2015: 199) lists “teacher’s personal perceptions, institutional support, computer competency and teacher training, teaching methodology and learner factors” as the factors affecting the normalization of CALL that demonstrates its current role and place with varying degrees of factorial changes throughout the years.

Critiquing CALL with reference to the meaning posed in the acronym, Jarvis and Achilleos (2013) show particular interest in the informal, namely out-of-class use of computers and the place of CALL in the current educational theory. They favor a MALU (Mobile Assisted Language Use) structure to describe the e-learning processes and to study informal learning environments rather than CALL pointing out language “acquisition” processed during the input exposure mobile devices offer. The decrease in the use of desktops along with the feature of anytime/anywhere information access are proposed as evidence for MALU with a broader social and academic use scope. On the other hand, Derakhshan and Khodabakhshzadeh (2011) compare e-learning and m-learning referring to their terminology, pedagogical differences and modes of communication. In terms of terminology, change is observed; however the meaning is overlapping; such as “collaborative” for e-learning is “networked” for m-learning.

Nonetheless, it should be kept in mind that best practices in CALL may not always be transferred to MALL implementations; this assumption requires an overview of research on MALL. Stockwell and Hubbard (2013) see MALL as the intersection of CALL and m-learning with its specific characteristics. In view of individual learner differences such as interaction and collaboration are some commonalities; additionally, “novelty effect” (2013:7)

that is the initial high-interest in a task doomed to diminish, the need for multiple data collection sources, learner readiness are other points of notice.

- *Meta-analyses on m-learning and MALL*

Meta-analysis on m-learning and MALL can be grouped as those on educational trends (Duman, Orhon, & Gedik, 2015; Wu et al, 2012), teacher education (Baran, 2014) and user perspectives (Capretz & Alrasheedi, 2013) learning outcomes (Burston, 2015). Meta-analysis on MALL shows a similar pattern to those on m-learning providing similar results.

Wu et al. (2012) list the analyzed studies according to their focus on effectiveness, mobile learning system design and feature positive perspectives generally emerging from the survey and experiment studies. Moreover, Baran (2014) draws the attention to a positive perspective on the integration of m-learning to teacher education; nevertheless, emphasizes the need for theoretical approaches, a variety of research methodology and professional development models relating MALL to pedagogical and professional practices. Burston (2015) clearly defines the stages of article inclusion after excluding 272 studies, only 19 meet the selection criteria of statistically stated learning outcomes. Hence, he draws the attention to the number of MALL studies with subjective interpretations and to the lack of quantitative studies on learning outcomes. Finally, Duman, Orhon and Gedik (2014) indicate that MALL studies, mostly, are without any theoretical framework and propose the integration of design-based research to MALL for further exploration.

Table 1. Meta-analyses on m-learning and MALL (2010-2015)

Author	Dates covered	Number of articles
Wu et al. (2012)	2003-2010	164
Baran (2014)	2000-2014	37
Duman et al. (2014)	2000-2012	69
Burston (2015)	1995-2015	19

### 3. Methodology

#### 3.1. Research Goal

This paper aims to outline the current research trends in mobile assisted language learning and to provide relevant pedagogical implications by analyzing the MALL research from 2010 to the first half of 2015; hence, a grounded theory based qualitative meta-analysis procedure was fulfilled.

Hence, the following research questions were posed to see the general framework of MALL research (2010-2015):

1. What types of technological tools are used to teach which language skills?
2. What are the learning and teaching contexts of MALL implementation?
3. What are the research outcomes considering the limitations as well?

#### 3.2. Sample and Data Collection

Grounded theory (Glaser & Straus, 1967) was adopted to synthesize and analyze data collected from the selected articles through databases (i.e. Scopus, Science Direct, and Google Scholar), journals (i.e. Computers & Education, Computer Assisted Language Learning, System, TESOL Quarterly, Journal of Language Learning and Teaching) and citation search of the relevant and selected research. Due to the nature of methodology, a continuous (re)selection and analysis during which coding took place was performed. Conference proceedings were not

excluded to stay objective and to avoid bias. Thirty-two articles that met the criteria form the data for analysis. The keyword search included the terms “MALL, mobile assisted language learning, mobile English learning, cell phones and language learning, mobile learning and language skills (speaking, reading, writing, listening, vocabulary and grammar)”. Explicit coding as stated by Glaser and Straus (1967) produced core codes like MALL and skills, technological tools, learning characteristics, research outcomes and challenges/limitations of MALL.

Studies fulfilling the following criteria indicated in Table 2 are included.

Inclusion	Exclusion
publication date between the years of 2010-2015	focus on m-learning
focus on language learning	book chapters

### 3.3. Analyses and Results

To start with the *general descriptive information*, journals and places of publication, research design models and language focus can be listed. Initially, the articles are accessed from 15 different journals, when conference proceedings are taken as a single journal type, among these: Procedia- Social Behavioral Sciences (n=6), Journal of Language Learning and Technology (n=5) and Computer Assisted Language Learning (n=4) are most commonly referred journals. The number of articles according to year is as following: 2010 (n=5), 2011(n=3), 2012 (n=2), 2013(n=11), 2014 (n=9) and 2015 (n=2). The geographical distribution of study locations can be identified clearly as Asia-oriented: the majority of studies took place in the East Asian (respectively Taiwan, Japan, China), in Western Asian (Iran) and South/east Asian (India, Malaysia; Singapore) countries, followed by Turkey, USA, and UK.

The studies can be grouped as effectiveness, attitudes and perception, teaching material (i.e. apps) design, mobile system adaptation and correlational studies based on their research design. Effectiveness studying with mixed-method approach incorporated both a questionnaire and an interview with the learners/users to see their attitudes and perceptions about the mobile implementation. Quasi-experimental research design with pre and post-tests mainly deal with the effect of mobile devices on language skills. For the theoretical background related to the technological aspect, Technology Acceptance Model (TAM) was the most adopted framework along with the TAM questionnaire (e.g. Hsu, 2015) by Davis (1989) covering dimensions of perceived usefulness, perceived ease of use and user acceptance of information technology. Besides, the second language acquisition theory, specifically interactionist approach linked to noticing hypothesis were applied in studies to design MALL software such as in studies by Li and Hegelheimer (2013) and de la Fuente (2014).

The *technological tools* of mobile assisted language learning are portable and ubiquitous: Mobile phones are the most preferred mobile device followed by iPods, PDAs, tablet PCs and MP3 players. Alongside the mobile device use, Web 2.0 tools such as wikis and Moodle provide interaction to language learning process; project websites (eg. Raz-Kids) and use of Facebook illustrates the emergence of social networking into the language studies. Language skills and technological tools used in the studies as seen in Table 3 demonstrates the attention to incorporating mobile devices to teach and practice second/foreign languages.

Table 3. Language skills and technological tools

Skill	Technological tool
Vocabulary	Microsoft Tags, SMS, ECTACO flash card, Longman mobile dictionary, game-based application, Fetion free text message software, VocabTutor (vocabulary activity system)
Reading	Online extensive reading program, Mebook, MCER (mobile-supported cooperative EFL reading) system
Listening	Caption filtering program, Mebook, Audiobooks
Speaking	Video recording program, audio recording program
Writing	Grammar Clinic, database for situated writing and comments

From the learner and learning perspective, *learning environment* and *learner profiles* show that MALL studies are generally conducted in higher education settings (n=26) including three studies with graduate students. It is followed by elementary schools (n=4) and senior high schools (n=2) all in Taiwan. What strikes most is the single study carried out with in-service EFL teachers. That is, all of the studies except for one, included students and explicitly undergraduate students. All proficiency levels of the related language (i.e. English, French, and Spanish) were covered from elementary to advance. Regarding the majors, a diverse educational subject is observed (i.e. TESOL/ELT, medicine, law, engineering and English language learners- EFL/ESL). The age of participants except for teachers is eight year olds as the youngest, 50 year olds as the oldest. The teacher profile can be observed in one particular study: Dashtestani (2013) questions teachers' attitude and perceptions along with their potential to use MALL devices and follow practices. Teachers are seen to overcome the stage of resistance and developed moderate levels of positive attitude to technology use; nevertheless they are not yet familiar with using their mobile devices for instruction and not trained to integrate MALL into their pedagogy.

*Research results* of the studies present an overall positive picture of m-learning in second/foreign language learning and teaching at all levels. In terms of skills, vocabulary instruction had a variety of focus such as significant effect of mobile devices on vocabulary learning (Agca & Özdemir, 2013; Başoğlu, Akdemir, 2010; Liu, 2014), no significant difference except for retention (Alemi, Sarab, & Lari, 2012), positive attitudes of primary school students (Sandberg, Maris, & de Geus, 2011; Wong & Looi, 2010), SMS use (Alemi, Sarab, & Lari, 2012), mobile dictionary integration ( Rahimi & Miri, 2014) and flashcard use (Başoğlu, Akdemir, 2010).

Reading was investigated using mobile assisted extensive reading programs (Lin, 2014), e-books (Chang, Liang, Yan, & Tseng, 2013), in-house reading materials (Wang & Smith, 2013), reading ability development of young learners (Lan, Sung, & Chang, 2013), individual and shared annotation function integration to reading materials (Hsu, Hwang & Chang, 2013). Studies on listening utilized audiobooks (Azar & Nasiri, 2014), mobile e-books with multimedia features (Chang, Liang, Yan, & Tseng, 2013), videos with caption filtering mode (Hsu, 2015) and integration of audio players such as iPods and MP3 players (de la Fuente, 2014; Demouy & Kukulska-Hulme, 2010). Speaking is studied along with grammar with a voice recording function of mobile devices (Baleghizadeh & Oladrostam, 2010) and listening with voice response system (Demouy & Kukulska-Hulme, 2010). Additionally, video recording (Gromik, 2012) made speaking practice possible. Writing focus of the analysed articles was on self-editing (Li & Hegelheimer, 2013) and situational learning system writing task performance during situations of playground, classroom and lunch (Hwang, Chen, Shadiev, Huang, & Chen, 2014). Finally, pronunciation was reinforced by a 3D talking-head mobile technology (Segaran, Ali & Hoe, 2014).

*Limitations* reported in the studies were mostly about the small sample size and short duration of procedures that are directly linked to problems in the generalization of results. Variety of data collection methods and a need for more theoretical grounded work combining qualitative and quantitative approach is stated as a must. Studies on system/software design and piloting self-critique about the lack of system update. The physical properties of mobile devices, especially the mobile phones, like small screen size and small keypads are seen among major barriers. Some technical issues still continue to exist; lack of network coverage, MALL tools and software. From the learner

and teacher perspective; teachers are found to stay away from educational use of mobile phones and not to possess necessary skills to integrate mobile devices into their teaching and professional development.

As observed in this analysis, vocabulary still seems to be the most popular skill to integrate MALL (Duman, Orhon, & Gedik, 2014). As for the popularity of SMS use, Li, Ogata, Hashimoto and Yano (2009) coined the term MESLL (mobile-based email or SMA in language learning) system to emphasize the research concentration on mobile phone email function and designed a system based on adaptive kanji learning. Golonka, Bowles, Frank, Richardson and Freynik (2014) underlined the emphasis on SMS for the empirical studies on mobile phones comparing students using SMS to those using Web and paper based practices. Moreover, these studies were mainly on vocabulary learning with recall feature analysis. Nonetheless, as Hu (2013) concluded too much emphasis on vocabulary learning through mobile devices need to be avoided.

The findings are parallel to those previously mentioned meta-analyses on MALL and m-learning (Baran, 2014; Burston, 2015; Duman et al., 2014; Wu et al., 2012) with some new highlights on second language acquisition theory, social networking and mobile-based software /system design in addition to student and teacher created system content and materials.

#### 4. Conclusion

This study with the aim of outlining the MALL research trends displayed a skill-based orientation towards language education through/with mobile devices. There are a few points to consider in light of the research mentioned above: firstly, as expressed by Wang and Smith (2013), it is interesting to note that unless mobile-assisted learning tasks are compulsory and monitored or graded as a course work, students are reluctant to be engaged in such tasks. Therefore, if MALL activities are to be integrated to the course, it should either be a core requirement to be graded or enjoyable, user-friendly activities that do not demand too much time and effort. Another issue raised was the student hesitancy to use mobile devices for educational purposes that are generally perceived as personal and private. Finally, considerations by Stockwell (2010) need further attention; interpreting the results of a longitudinal study lasting three years illustrate the role of environmental conditions and multitasking and that longer periods of time is required to complete some tasks than is required on PC. The conditions of MALL task engagement are to be considered and investigated within the research framework.

The results achieved in this paper are limited to the time framework and accordingly the number of studies included. Without any such intention, this analysis included MALL articles only on English, Spanish and French. It can then be further suggested that MALL is taken as a promising area to explore for researchers, to follow and implement for teachers and to show growing interest and enthusiasm for students.

#### References

- Agca, R. K., & Özdemir, S. (2013). Foreign language vocabulary learning with mobile technologies. 2nd World Conference on Educational Technology Researches. *Procedia- Social and Behavioral Sciences*, 83, 781-785.
- Alemi, M., Sarab, M. R., & Lari, Z. (2012). Successful Learning of Academic Word List via MALL: Mobile Assisted Language Learning. *International Education Studies*, 5 (6), 99-109.
- Al-Shehri, S. (2011). Context in our pockets: Mobile phones and social networking as tools of contextualizing language learning. *Proceedings of 10th World Conference on Mobile and Contextual Learning*. Beijing, China, 18-21 October 2011.
- Azar, A. S., & Nasiri, H. (2014). Learners' Attitudes toward the Effectiveness of Mobile Assisted Language Learning (MALL) in L2 Listening Comprehension, International Conference on Current Trends in ELT. *Procedia- Social and Behavioral Sciences*, 98, 1836-1843.
- Baleghizadeh, S., & Oladrostam, E. (2010). The effect of Mobile Assisted Language Learning (MALL) on grammatical accuracy of EFL students. *MEXTESOL*, 34 (2), 1-10.
- Baran, E. (2014). A review of research on mobile learning in teacher education. *Educational Technology & Society*, 17 (4), 17-32.
- Başoğlu, E. B., & Akdemir, Ö. (2010). A comparison of undergraduate students' English vocabulary learning: Using mobile phones and flash cards. *TOJET: The Turkish Online Journal of Educational Technology*, 9 (3), 1-7.
- Burston, J. (2015). Twenty years of MALL project implementation: A meta-analysis of learning outcomes. *ReCALL*, 27, 4-20.

- Capretz, L.F., & Alrasheedi, M. (2013). A meta-analysis of critical success factors affecting mobile learning. Electrical and Computer Engineering Publications, paper #18.
- Chang, C., Liang, C., Yan, C., & Tseng, J. (2013). The impact of college students' intrinsic and extrinsic motivation on continuance intention to use English mobile learning systems. *Asia-Pacific Edu Res*, 22 (2), 181-192.
- Chinnery, G. M. (2006). Emerging technologies. Going to the MALL: Mobile Assisted Language Learning. *Language Learning & Technology*, 10 (1), 9-16.
- Dashtestani, R. (2013). Implementing mobile-assisted language learning (MALL) in an EFL context: Iranian EFL teachers' perspectives on challenges and affordances. *JALTCALL Journal*, 9(2), 149-168.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13 (3), 319-340.
- De la Fuente, M. J. (2014). Learners' attention to input during focus on form listening tasks: the role of mobile technology in the second language classroom. *Computer-Assisted Language Learning*, 27 (3), 261-276.
- Demouy, V., & Kukulska-Hulme, A. (2010). On the spot: using mobile devices for listening and speaking practice on a French language programme. *Open Learning: The Journal of Open, Distance and e-Learning*, 25(3), 217-232.
- Derakhshan, A., & Khodabakhshzadeh, H. (2011). Why CALL why not MALL: An in-depth review of text-message vocabulary learning. *Theory and Practice in Language Studies*, 1 (9), 1150-1159.
- Duman, G., Orhon, G., & Gedik, N. (2015). Research trends in mobile assisted language learning from 2000 to 2012. *ReCALL*, 27(2), 197-216.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Hawthorne, NY: Aldine de Gruyter.
- Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Freynik, S. (2014). Technologies for foreign language learning: a review of technology types and their effectiveness. *Computer Assisted Language Learning*, 27 (1), 70-105.
- Gromik, N. A. (2012). Cell phone video recording feature as a language learning tool: A case study. *Computers & Education*, 58, 223-230.
- He, B., Puakpong, N., & Lian, A. (2015). Factors affecting the normalization of CALL in Chinese senior high schools. *Computer Assisted Language Learning*, 28 (3), 189-201.
- Hsu, L. (2013). English as a foreign language learners' perception of mobile assisted language learning: a cross-national study. *Computer Assisted Language Learning*, 26 (3), 197-213.
- Hsu, C. (2015). Learning motivation and adaptive video caption filtering for EFL learners using handheld devices. *ReCALL*, 27, 84-103.
- Hsu, C., Hwang, G., & Chang, C. (2013). A personalized recommendation-based mobile learning approach to improving the reading performance of EFL students. *Computers & Education*, 63, 327-336.
- Hu, Z. (2013). Vocabulary learning assisted by mobile phones: perceptions of Chinese adult learners. *Journal of Cambridge Studies*, 8 (1), 139-154.
- Hwang, W., Chen, H., Shadiev, R., Huang, Y.-M., & Chen, C.-Y. (2014). Improving English as a foreign language writing in elementary schools using mobile devices in familiar situational contexts. *Computer Assisted Language Learning*, 27 (5), 359-378.
- Jarvis, H., & Achilleos, M. (2013). From Computer Assisted Language Learning (CALL) to Mobile Assisted Language Use (MALU). *The Electronic Journal for English as a Second Language*, 16 (4), 1-18.
- Kim, D., Rueckert, D., Kim, D., & Seo, D. (2013). Students' perceptions and experiences of mobile-learning. *Language Learning & Technology*, 17 (3), 52-73.
- Lan, Y., Sung, Y., & Chang, K. (2013). From particular to popular: Facilitating EFL mobile-supported cooperative reading. *Language Learning & Technology*, 17 (3), 23-38.
- Li, M., Ogata, H., Hashimoto, S., & Yano, Y. (2009). Adaptive Kanji learning using mobile-based email. *Proceedings of the 17<sup>th</sup> international conference on computers in education*. Hong Kong: Asia-Pacific Society for Computers in Education, 520-526.
- Li, Z., & Hegelheimer, V. (2013). Mobile-assisted grammar exercises: effects on self-editing in L2 writing. *Language Learning & Technology*, 17 (3), 135-156.
- Lin, C. (2014). Learning English reading in a mobile-assisted extensive reading program. *Computers & Education*, 78, 48- 59.
- Liu, P. & Chen, C. (2014). Learning English through actions: a study of mobile-assisted language learning. *Interactive Learning Environments*, 23 (2), 1-14.
- Muhammed, A. A. (2014). The impact of mobiles on language learning on the part of English Foreign Language (EFL) university students. Global Conference on Linguistics and Foreign Language Teaching LINELT 2014, Procedia- Social Behavioral Sciences 136, 104-108.
- Öz, H. (2014). Prospective English teachers' ownership and usage of mobile devices as m-learning tools. WCLTA 2013, *Procedia- Social and Behavioral Sciences*, 141, 1031-1041.
- Rahimi, M., & Miri, S. S. (2014). The impact of mobile dictionary use on language learning. International Conference on Current Trends in ELT, *Procedia- Social and Behavioral Sciences*, 98, 1469-1474.
- Sandberg, J., Maris, M. & Geus, K., (2011). Mobile English learning: An evidence-based study with fifth graders. *Computers & Education*, 57, 1334-1347.
- Savaş, P. (2014). Tablet PCs as instructional tools in English as a foreign language education. *TOJET: The Turkish Online Journal of Educational Technology*, 13 (1), 217-222.
- Segaran, K., Ali, A. Z., & Hoe, T. W. (2014). Usability and user satisfaction of 3D talking-head Mobile Assisted Language Learning (MALL9 app for non-native speakers. WCETR 2013, *Procedia- Social and Behavioral Sciences*, 131, 4-10.
- Shanmugapriya, M., & Tamilarasi, A. (2013). Design and development of Mobile Assisted Language Learning (MALL) application for English language using Android push notification services. *International Journal of Research in Computer and Communication Technology*, 2 (6), 329- 338.

- Soleimani, E., İsmail, K., & Mustaffa, R. (2014). The acceptance of Mobile Assisted Language Learning (MALL) among post graduate ESL students in UKM. SoLLs.INTEC.13. *Procedia- Social and Behavioral Sciences*, 118, 457-462.
- Stockwell, G. (2007). A review of technology choice for teaching language skills and areas in the CALL literature. *ReCALL*, 19 (2), 105-120.
- \*Stockwell, G. (2010). Using mobile phones for vocabulary activities: Examining the effect of the platform. *Language Learning & Technology*, 14 (2), 95-110.
- Stockwell, G., & Hubbard, P. (2013). Some emerging principles for mobile-assisted language learning. Monterey, CA: The International Research Foundation for English Language Education. Retrieved on April 12, 2015 from [http://www.tirfonline.org/wp-content/uploads/2013/11/TIRF\\_MALL\\_Papers\\_StockwellHubbard.pdf](http://www.tirfonline.org/wp-content/uploads/2013/11/TIRF_MALL_Papers_StockwellHubbard.pdf)
- Taki, S., & Khazaei, S. (2011). Learning vocabulary via mobile phone: Persian EFL learners in focus. *Journal of Language Teaching and Research*, 2 (6), 1252-1258.
- Tomakin, E. & Yeşilyurt, M. (2013). Meta-analysis of computer assisted foreign language teaching studies: A sample of Turkey. *YYU Journal of Education Faculty*, 10 (1), 248-263.
- Wang, S., & Smith, S. (2013). Reading and grammar learning through mobile phones. *Language Learning & Technology*, 17(3), 117-134.
- Wong, L-H., & Looi, C-K. (2010). Vocabulary learning by mobile-assisted authentic content creation and social meaning-making: two case studies. *Journal of Computer Assisted Learning*, 26, 421-433.
- Wu, Q. (2015). Designing a smartphone app to teach English (L2) vocabulary. *Computers & Education*, 85, 170-179.
- Wu, W., Wu, Y. J., Chen, C., Kao, H., Lin, C., & Huang, S. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers & Education*, 59, 817-827.
- References marked with an asterisk indicate the articles used in the meta-analysis.