A systemic mapping study of Mobile Assisted Language Learning methods and practices: a qualitative literature review

Eshbayev Oybek
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

Rakhimova Shahodat
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

Samandarova Nargiza
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

Yuldosheva Rano
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

Yunusova Feruzakhon
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

Shermukhamedova Dilnozakhon
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

Sanjar Mirzaliev
Tashkent State University of Economics, I. Karimov Str., 49, 100066, Uzbekistan
o.eshbaev@tsue.uz

ABSTRACT

Pedagogical use of mobile applications has become a novel approach for language teaching, resulting in higher student engagement and motivation. There are a number of methods and practices that have been created so far to incorporate into language classroom at the disposal of language educators. However, extracting relevant and suitable information from growing bodies of research and teaching practices to apply in a specific teaching context is tedious and time-consuming requirement for those who want to use the state-of-the-art methods of mobile assisted language teaching in their classroom. Thus, the aim of this systematic mapping study is to structure the knowledge of using Mobile Assisted Language Learning methods and practices and provide a comprehensive overview of the current state of the art in this domain of language teaching. Besides giving the structure of relevant research areas and the portfolio of key publications, the paper also outlines classification of mobile assisted language learning solution proposals and the visual status of the target research areas. Finally, it represents future research agenda and draw implications.

ICFNDS '22, December 15, 2022, Tashkent, TAS, Uzbekistan

ACM ISBN 978-1-4503-9905-0/22/12…$15.00
https://doi.org/10.1145/3584202.3584294

CCS CONCEPTS

• **Mobile assisted language learning**; • **the state-of-the-art methods**; • **classified portfolio of publications**; • **Visualized categories**;

ACM Reference Format:
Eshbayev Oybek, Rakhimova Shahodat, Samandarova Nargiza, Yuldosheva Rano, Yunusova Feruzakhon, Shermukhamedova Dilnozakhon, and Sanjar Mirzaliev. 2022. A systemic mapping study of Mobile Assisted Language Learning methods and practices: a qualitative literature review. In *The 6th International Conference on Future Networks & Distributed Systems (ICFNDS '22), December 15, 2022, Tashkent, TAS, Uzbekistan.* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3584202.3584294

1 INTRODUCTION

Mobile devices have become indispensable part of human life since it gives a number of benefits to people such as multifunctional services, a sense of personal ownership, the wider accessibility, portability and many more. Innovative functions of mobile technologies especially internet access, audio/video recording, and picture capturing have modernized significantly the ways how we lived before. There is also no denying for the fact that those modern amenities have come into language teaching classroom, causing the paradigm shift in pedagogical mind "mobile device is an assistant of teaching instead of saying it as a disruptor" [1-4]. The way how mobile technologies especially smartphones can be used effectively for educational purposes has been explored continuously by the scientific communities [5-11] from different perspectives. Systematically mapping the educational affordances of mobile devices enable educators, practitioners, researcher to adopt fast and use properly a number of mobile applications that promote and facilitate teaching and learning languages. That is what the paper is about.

In the next sections, the paper is structured as follows. Section 2 describes research methods and data analysis/selection processes used in this study. Then, the section 3 provides the findings and classified portfolio of key documents and terms as well as the visualized status of the target research domain. It also provides discussion of research findings, limitations, future research directions and concludes the paper.

2 RESEARCH METHODOLOGY

The methodology that we have decided to use in this paper is a systematic mapping approach that enable us to achieve a comprehensive overview of the recent state of the art methods and practices of Mobile Assisted Language Learning (MALL). It also helps to structure the growing body of knowledge in the target research domain based on multidisciplinary knowledge areas [12-32].

The whole procedure of a systematic mapping study can be divided into two broad steps: planning of the study and conducting of the study. These two steps can also be broken down into sub-steps accordingly, the former (establishing research questions, search strategy, and selection criteria) and the latter (analysis & mapping, data extraction & classification, search execution, and filtering of candidate studies). By providing the state of the art of the mobile assisted language learning methods and practice, we aim to achieve to structure knowledge that others are missing as fragmented and unstructured.

2.1 Research questions and Search strategy

Establishing research questions that embody the purpose and method of the research guides us properly in the right pathways, reducing the noise from massive amount of data and enhancing appropriateness of research activities. Considering this, we have decided to find answers for the following questions during the implementation of the systematic mapping study.

Research question 1

What main contributions have been made in previous researches regarding applying MALL methods and practices?

Research question 2

What key terminology or phrases identifies the main topics that are relevant to the state-of-the-art methods and practices of applying MALL?

Research question 3

What publications contain high values for encompassing the current status of the educational use of mobile technologies?

The first two questions are intended to reveal the scope and discourse of MALL methodology while the last one enables us to identify the most valuable papers to include in our portfolio of key publications.

In addition to research questions, we also decided to use the following academic databases to search for relevant content.

- Research gate
- Science direct
- Web of science
- ACM digital libraries

The decision of selecting these databases is mainly related to high quality and the most up to date contents of the research papers. Our pilot and main inquiries will be done upon those databases.

2.2 Selection criteria

Another important factor of effective filtering of a huge data is well established and appropriate inclusion and exclusion criteria, which also contributes to the success of the systematic mapping study. The table 1 outlines the statements that formalizes our inclusion and exclusion criteria. It contains 4 inclusion and 4 exclusion criteria.

This table is intended to be used in the process of data analysis and extraction to effectively filter information. It also serves as the guiding rules for the authors to extract relevant content from the selected data.

3 RESULTS

This section outlines data collections, analysis procedures and their findings.

3.1 Search execution, Literature review, and Data analysis

The group of three researchers (author is included) actively participated in research process. They annotated and analyzed the candidate studies from the aforementioned academic databases with relevance to research questions and selection criteria. They extracted the relevant information and classified them into three categories: methods, mobile applications and practices. As the result, a pool of 10 key articles [1-10] was formed as the recommended portfolio of the articles. Figure 1 below provides information about the main findings retrieved from literature review and data analysis processes.

The table elaborates the widely used methods or practices and two representatives of the state-of-the-art mobile applications with definitions and sub-terminology for detailed explanation of the app or model.

4 DISCUSSIONS AND CONCLUSION

It is safe for us to evaluate how well we have performed so far with reference to the research questions. According to RQ1 and RQ2, we have extracted main contributions (in the examples of methods, practices, and mobile applications) and key terms/phrases to encompass the main topics of mobile assisted language learning and their main details. Meanwhile, it is identified that Activity-theory based framework for MALL [3], Unified theory of acceptance and use of technology (UTAUT) [4], DIDEA model: Determine, Illustrate, Development, Technology – based funds of Knowledge [8], Execute and Analyze [10] are found to be commonly used methods of mobile assisted language learning. We have also identified a pool of key publications from our literature review process, which is the focus of the research question 3. Regarding this classified portfolio of publications, we strongly recommend the publications [1 – 10, 12] for readers since it can provide influential contents. Two representatives of the state-of-the-art mobile applications [6, 10] are also included in our systematic mapping study as necessary tools for consideration.

The tabulated information retrieved from literature review and data analysis identifies three main categories of mobile assisted language learning. These are methods, practices, and mobile applications. This categorization is further enhanced by the visual mind mapping tool, Coggle website with

Table 1: Selection criteria

Inclusion criteria	Exclusion criteria
The articles should discuss directly mobile assisted language learning	Copies of the same studies
The articles that describe effective methods or practices of using MALL approach should be included	Quality evaluation studies (since our aim is not assessing the quality of MALL teaching or method)
The articles that aim at literature reviews or systematic mapping studies in the same domain but different purpose should be included	Articles are not in English
The articles that identify trends in educational use of mobile devices should be included	Very old or outdated studies

Methods or practices	Definition	Key terms/ Phrases
Activity-theory based framework for MALL (Bakhurst 2009)	The analysis of learning process and influences of mobile learning in order to interpret the interactive relationships of human habits and mobile tools	Vygotsky's theory, visualization system with triangles, six major components, Tools-Context-Object triangle
Unified theory of acceptance and use of technology (UTAUT)	A model of examining MALL acceptance, the improvement of technical and organizational supports	Behavioural intention & The use behavior, the four core constructs: performance expectancy, effort expectancy, social influence and facilitating condition
The use of 3D talking-head Mobile Assisted Language Learning to enhance pronunciation	3D talking head app for Pronunciation learning	User interface, audio &video principles, Animation principle, color principle
DIDEA model: Determine, Illustrate, Development, Execute and Analyze	A development procedure guide for instructional material design and mobile phone application development	Subtasks explaining the function of each phase
Interactive Multimedia based Mobile Application for language learning	I-MMAPLS is mobile application created by adapting conversational model and constructivism learning theory	Content framework components resources, learning theories, and interactivity Mobile device model
Technology – based funds of Knowledge	The FoK concept is an approach to empower culturally and linguistically diverse families based on Vygotsky's theories of cultural – historical psychology	FoK categorization of family, parent's perception about MALL use for their children from sociocultural backgrounds, motivation, physical access, digital skills, and different usage
Mobile learning games as an ideal platform to teach second language skills	Game play is about producing significant learning benefits and enhancing students' basic skills	ubiquitous, affordable, compact and wireless

Figure 1: Outline of mobile assisted language learning practices/ methods and their relevant terms/ definitions

the direct link: https://coggle.it/diagram/YpTYdDctkOag_ox/t/ /23d5dcdc264d1b2468e656058e4d7a8208d9940c089f63fbc48d4235fdf4ec11

The main shortcomings of this study may be the limited range of research articles forums and unexplored evidence of the same results yielded by using this systematic mapping study 's equal effects on other contexts such as multicultural classrooms. Since there is no all in one strategy for encompassing all aspects of conducting research, our study aimed at achieving successful contribution rather than perfection. In this sense, we believe that our systematic mapping proposal holds its own philosophical value for those who seek for the fastest and efficient way of extracting relevant and appropriate contents suitable for their classroom from massive amount of data.

Regarding future research directions, we would suggest that more advanced level of mobile technology incorporation should be explored since we have identified the increasing need for cutting edge technology applications especially artificial intelligence tools and research gaps in that field. Thus, the incorporation and creation of deep learning, artificial intelligence, machine learning and advanced human-computer interaction models that are rooted in the principles of artificial intelligence technology is necessary to meet the needs of the youngest generation who expect natural benefits from foreign language learning mobile applications.

REFERENCES

[1] Stockwell Hou, Z., & Aryadoust, V. (2021). A review of the methodological quality of quantitative mobile-assisted language learning research. System, 100, 102568.

[2] , G. (2022). Mobile assisted language learning: Concepts, contexts and challenges. Cambridge University Press.

[3] Sung, Y. T., Chang, K. E., & Yang, J. M. (2015). How effective are mobile devices for language learning? A meta-analysis. Educational research review, 16, 68-84.

[4] Hoi, V. N. (2020). Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach. Computers & Education, 146, 103761.

[5] Azar, A. S., & Nasiri, H. (2014). Learners' attitudes toward the effectiveness of mobile assisted language learning (MALL) in L2 listening comprehension. Procedia-Social and Behavioral Sciences, 98, 1836-1843.

[6] Chachil, K., Engkamat, A., Sarkawi, A., & Shuib, A. R. A. (2015). Interactive multimedia-based mobile application for learning Iban language (I-MMAPS for learning Iban language). Procedia-Social and Behavioral Sciences, 167, 267-273.

[7] Pikhart, M. (2021). Human-computer interaction in foreign language learning applications: applied linguistics viewpoint of mobile learning. Procedia Computer Science, 184, 92-98.

[8] Chen, Y., Mayall, H. J., York, C. S., & Smith, T. J. (2019). Parental perception and english learners' mobile-assisted language learning: an ethnographic case study from a technology-based funds of knowledge approach. Learning, Culture and Social Interaction, 22, 100325.

[9] Miangah, T. M., & Nezarat, A. (2012). Mobile-assisted language learning. International Journal of Distributed and Parallel Systems, 3(1), 309.

[10] Segaran, K., Ali, A. Z. M., & Hoe, T. W. (2014). Usability and user satisfaction of 3D talking-head mobile assisted language learning (MALL) app for non-native speakers. Procedia-Social and Behavioral Sciences, 131, 4-10.

[11] Kukulska-Hulme, A., & Shield, L. (2008). An overview of mobile assisted language learning: From content delivery to supported collaboration and interaction. ReCALL, 20(3), 271-289.

[12] Alikovich Eshbayev, O., Xamidovich Maxmudov, A., & Urokovich Rozikov, R. (2021, December). An overview of a state of the art on developing soft computing-based language education and research systems: a survey of engineering English students in Uzbekistan. In The 5th International Conference on Future Networks & Distributed Systems (pp. 447-452).

[13] Eshbayev, O. A., Mirzaliev, S. M., Rozikov, R. U., Kuzikulova, D. M., & Shakirova, G. A. (2022, June). NLP and ML based approach of increasing the efficiency of environmental management operations and engineering practices. In IOP Conference Series: Earth and Environmental Science (Vol. 1045, No. 1, p. 012058). IOP Publishing.

[14] Avezimbetovich Sharipov, K., & Alisherovna Abdurashidova, N. (2021, December). Benchmarking Strategy for Industrial Enterprise Development. In The 5th International Conference on Future Networks & Distributed Systems (pp. 318-322).

[15] Safaeva, S.R., Alieva, M.T., Abdukhalilova, L.T., Alimkhodjaeva, N.E., & Konovalova, E.E. (2020). Organizational and Economic Aspects of the Development of the International Tourism and Hospitality Industry. *Journal of Environmental Management and Tourism, 11*, 913-919.

[16] Azimkulovich, E. S., Elshodovna, A. N., Qizi, B. M. X., Qizi, O. S. S., Bakhtiyorovich, S. I., & Obitovich, K. M. (2021). Strategy of higher education system development: in case of uzbekistan. Review of International Geographical Education Online, 11(10), 1973-1988.

[17] Elshodovna, A. D. (2022). Improving the use of modern information technologies in commercial banks. World Economics and Finance Bulletin, 14, 232-235.

[18] Gulamuddinova, Z. N., Tulkunovna, S. D., Utkurovna, R. S., Yusopov, M. A., & Narimanovna, K. S. (2020). Ways Of Improving Education System By Building A Brand Equity Of The University. European Journal of Molecular & Clinical Medicine, 7(3), 3766-3771.

[19] Gulamuddinovna Zufarova, N., Tulkunovna Shakirova, D., & Zafarbek qizi Shakirova, D. (2021, December). Merits and Demerits of E-Commerce in Republic of Uzbekistan During Pandemic Period. In The 5th International Conference on Future Networks & Distributed Systems (pp. 790-794).

[20] Shakirova, D., Rakhimova, S., Babayeva, K., Karimov, F., & Komilova, Z. (2020). Improving integrity of classes, teachers and schools: Empirical analyses on education market indicators. International Journal of Psychosocial Rehabilitation, 24(6), 7049-7065.

[21] Zufarova, N. (2020). Influence of internalization to the competitiveness of higher education in The Republic of Uzbekistan. Asian Journal of Technology & Management Research, 10(01).

[22] Zufarova, N. (2022). Econometric Analysis of Higher Educational Institutions for Developing Brand Equity Value. International Journal of Multicultural and Multireligious Understanding, 9(6), 221-235.

[23] Gulamiddinovna, Z. N. (2022). Methodology for Brand Equity Assessment of Universities in Transformation Period of the Educational System. Asian Journal of Technology & Management Research (AJTMR) ISSN, 2249(0892).

[24] Ikramov, M., Eshmatov, S., Samadov, A., Imomova, G., & Boboerova, M. (2021). Management Marketing Strategy for Formation of Local Brand of Milk and Dairy Products in the Digital Economy. Revista geintec-gestao inovacao e tecnologias, 11(2), 443-466.

[25] Yadgorova, M. L., & Akhmedova, D. E. (2021). Competition in the market of banking services: Theory and practice. Academicia: An International Multidisciplinary Research Journal, 11(10), 1624-1630.

[26] Elshodovna, A. N., & Abdukhalilovich, R. B. (2020). Trends in Enhancing Uzbekistan's Competitiveness in the Textile Market. Central Asian Journal of Innovations on Tourism Management and Finance, 1(1), 41-49.

[27] Elshodovna, A. N., & Alisherovna, A. N. (2019). Formation of assortment strategies for light industry enterprises: in case of namangan region. Advance and Innovative Research, 139.

[28] Abdukhalilova, L. T., & Alimkhodjaeva, N. E. (2021). Crowd marketing in marketing research. South asian journal of marketing & management research, 11(1), 40-46.

[29] Muhammadolimovna, K. Z. (2022). USING MATERIALS FOR INTERACTIVE ESP LESSONS. Journal of Academic Research and Trends in Educational Sciences, 1(5), 131-136.

[30] Muhammadolimovna, K. Z. (2023). METHODS OF DEVELOPING ACADEMIC WRITING SKILLS OF STUDENTS. American Journal of Pedagogical and Educational Research, 8, 149-154.

[31] Saidov, M. (2021, December). Increasing Management Efficiency in The Electricity Sector of Uzbekistan. In The 5th International Conference on Future Networks & Distributed Systems (pp. 343-347).

[32] Samadovich, S. M. (2023). Features of the System of Digital Information and Communication Technologies in the Management of Companies. American Journal of Economics and Business Management, 6(1), 196-202.