

**Non-native Korean speaker preference towards mobile-assisted Korean language learning based on vocabulary / dictionary features**

Ahmad Fouad Abd Mubin<sup>1\*</sup>, Norah Md Noor<sup>2</sup>

<sup>1,2</sup> School of Education, Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia, Johor, Malaysia

ARTICLE INFO

Article history:

Received 10 Oktober 2022

Accepted 02 November 2022

Published 30 November 2022

Keywords:

Mobile Assisted Language Learning

Mobile Apps

Korean Language

Non-native Korean speaker

Foreign language learning

ABSTRACT

One of the languages that is becoming more and more popular to learn as a second language is Korean. The learning procedure is largely the same as it is for other languages. Future inclusion of educationally focused apps, such as those for learning the Korean language, is made possible by the development of ever-sophisticated mobile applications. Nevertheless, not all of these apps may produce the desired results. Deficits could give people the impression that their requirements can't be addressed. Mainly the vocabulary, grammar, and dictionary feature is important for a good learning apps. So, this study aims to determine the top two mobile applications students use to learn Korean based on vocabulary/dictionary feature, preferred by non-native Korean speakers in Malaysia. Secondary data analysis (top ten websites on learning the Korean language) was conducted and descriptively analysed. The study showed that non-native Korean students chose Naver Dictionary/Papago and Dongsa to learn Korean language. Future research implications of these discoveries are highlighted.

\* Corresponding author. E-mail address: ahmadfouad@gmail.com

INTRODUCTION

With the development of technology, which enables the mobile phone to fulfil multiple duties, the global use of mobile phones and smartphones is rising rapidly. In the sphere of education, this technology can provide more options for inquiry and the identification of advantages that can enhance the current teaching style. Smartphones have developed into a desirable device in the information and communication technology due to the current rise in smartphone adoption by mobile users (Alfawareh & Jusoh, 2014). The development of mobile apps is advancing at the same rate as that of mobile device technology. Mobile apps serve as software that completes specific tasks for mobile device users. Apps continue to be at the centre of digital marketing strategies and have an impact on economies all over the world, even though their growth has steadily slowed down. Over the past decade, the popularity of apps has continued to rise. Currently, more than 2.87 million apps are available (Stocchi et al., 2022).

Given the popularity of mobile devices, especially smartphones, it has become clear that this tool holds great promise as a source of information access and storage. Beyond the advancement of smartphones themselves, the emergence of ever-sophisticated applications paves the way for the eventual inclusion of educationally focused apps. This study aims to investigate the use of mobile applications for language learning. Korean is one of the languages that is becoming increasingly popular to learn as a second language (Nikitina & Furuoka, 2019). The process of learning a language is essentially the same as learning another one. The focus will be on the Korean language because it consists of mobile applications created solely for learning the Korean language. Given their simple access to a variety of downloaded mobile applications, students should be free to select any application they feel will help them

learn Korean. However, not all these applications are able to produce the desired results. People may feel their needs cannot be met because of deficiencies. Selecting genuinely helpful mobile apps is getting more challenging as the number of apps available increases. There is a possibility that learning objectives will not be met, as well as an increase in distractions and the complexity of knowledge transmission (Kulesza et al., 2010). Efforts should be made to find applications that have a positive impact on users, particularly online learners who use these applications as learning aids and for independent study. In the future, it is intended that the usage trend of the application used to learn the Korean language in Malaysia can serve as a reference for other users. This study sought to identify the top two most preferred mobile learning applications used by students to learn Korean language descriptively. The finding perhaps to give some reference to propose teachers, students, or educational institutions for suitable applications for learning the Korean language.

## LITERATURE REVIEW

Mobile learning is the process of acquiring knowledge in a variety of contexts through social and content exchanges as well as the use of mobile devices. Traxler (2005) defines mobile learning as "any educational provision where handheld or palmtop devices are the sole or dominant technologies". It emphasises the mobility of the learner and the applications that enable the creation of learning aids and materials, which have become an integral part of informal learning. Using mobile devices as a learning tool has demonstrated significant potential inside and outside the classroom (Sung et al., 2015).

Devices such as mobile phones, tablets, and laptops have significantly impacted the mobility of learning material accessibility. Furthermore, Ahmad (2020) asserts that mobile devices have revolutionised teaching methods and how people perceive education (Ahmad, 2020). Smartphones are one of the most popular mobile learning tools in today's classrooms. Smartphone-based mobile learning may improve the learning process, at least for some subjects, because it is prevalent, easily accessible, and efficient (Golshah et al., 2020). The smartphone has expanded its functionality beyond that of a mere communication device to become an aid to learning (Thakre & Thakre, 2015).

Smartphones provide nearly identical computational benefits to a personal computer while significantly more affordable, portable, and small (Saleh et al., 2012). Students could now connect with their peers, instructors and learning materials whenever they wanted and from any location where they had internet connectivity (Lowenthal & Bose, 2016; Boulos et al., 2011; Deng et al., 2019). In terms of the language learning field, Mobile-Assisted Language Learning (MALL) is associated with technology, especially mobile phone technology. Systems for mobile learning offer fresh possibilities for improved language learning. According to Atan & Shahbodin (2018), if a student-centered classroom with the addition of a mobile learning environment was created and was less formal than the traditional style of teaching and learning, students might be actively engaged in their independent learning.

More than 800,000 mobile device apps are available in the two biggest app stores, the Apple App Store and Google Play. According to estimates, there may be up to 2,000 language-learning apps (Sweeney & Moore, 2012). Many of these iPhone and Android apps assist in language learning, including Korean. Others have identified and rated apps for all languages and specific languages, such as Japanese and English. Many apps are comparable to others that have been accessible on phones for some time, such as flashcard programmes, dual language dictionaries, and phrasing apps (Godwin-Jones, 2011). A study by Gangaiamaran and Pasupathi (2017) shows a general language learning app that is categorised by learner level: primary, secondary, and tertiary. Each level has different mobile apps preference that should be suitable for the targeted audience. The apps' features or functions include video, gamified, vocabulary, grammar, flashcards, and dictionaries (Gangaiamaran & Pasupathi, 2017). Choo (2021) listed number of apps commonly used for Korean language learning and categorised by their primary purpose in the Table 1.

**Table 1:** *Application for Korean Language Learning*

Apps	Main purpose of the app
Google Translator Naver Dictionary Papago	Linguistic Knowledge
Youtube Netflix	Entertainment
Lingodeer Memrise Duolingo Drops: Learn Korea Sejong Korean App	Language learning
Hello Talk Tandem Speaky	Interaction with native Koreans

The study explains that both older and younger generations of Korean language learners most frequently used Papago translation, YouTube, Naver dictionary, Google translator, and Netflix for Korean language study. While language learning applications such as LingoDeer, Memrise, and Duolingo, as well as language exchange/tutoring apps, were not particularly popular among Korean learners, the younger generation in their 20s and 30s used a broader variety of apps (Choo, 2021).

A suggestion was being made to examine smartphone learning apps for the Korean language” (Luef et al., 2020). However, due to limitations, not many studies written in English have been found or accessed regarding the use of smartphones for Korean language learning.

## METHODOLOGY

### Research Design

The main design for this research is Secondary quantitative research, also known as desk research. Researchers use the already existing data in this research method, also known as secondary data. This existing data is then summarised using descriptive analysis. The purpose is to gain general information on the most popular apps used commercially by users on the internet. Firstly, website searches with a proper keyword were done to list several websites that listed out or ranked the mobile apps. All these apps later to be analysed and evaluated. Literature reviews was also done to determine which mobile apps and features are most deserving of being in the top two positions.

## FINDINGS

A Google search is conducted first to obtain the most popular apps. The results show several websites that list some of the most popular apps on the market. Although the methodology used by the website to determine rankings for those apps cannot be identified, it serves as a good starting point for this research.

**Table 2** List of Websites that ranks in the top 10 or best apps for learning Korean.

	Website	URL
1	10 Best Free Apps to Learn the Korean Language	<a href="https://www.koreatravelpost.com/10-free-korean-learning-apps/">https://www.koreatravelpost.com/10-free-korean-learning-apps/</a>
2	13 Best Apps to Learn Korean Quickly at Home (2022)	<a href="https://www.langoly.com/korean-learning-apps/">https://www.langoly.com/korean-learning-apps/</a>
3	10 Of The Best FREE Korean Learning Apps 2022	<a href="https://10mag.com/10-of-the-best-free-korean-learning-apps/">https://10mag.com/10-of-the-best-free-korean-learning-apps/</a>
4	10 Killer Korean Apps That Get Learners Addicted to the Language	<a href="https://www.fluentu.com/blog/korean/korean-apps/">https://www.fluentu.com/blog/korean/korean-apps/</a>
5	Top 18 Apps to Learn Korean Like a Pro [2022]	<a href="https://learnlanguagesfromhome.com/apps-to-learn-korean/">https://learnlanguagesfromhome.com/apps-to-learn-korean/</a>
6	Best Apps to Learn Korean in 2021	<a href="https://flexiclass.com/korean/best-apps/">https://flexiclass.com/korean/best-apps/</a>
7	10 best Korean learning apps for Android	<a href="https://www.androidauthority.com/best-korean-learning-apps-for-android-867396/">https://www.androidauthority.com/best-korean-learning-apps-for-android-867396/</a>
8	Top 10 Korean Language Learning Apps	<a href="https://www.expatkidskorea.com/article/top-10-korean-language-learning-apps.html">https://www.expatkidskorea.com/article/top-10-korean-language-learning-apps.html</a>

The availability of an app in a platform for downloading apps, such as Google Playstore or Apple Store, indicates its popularity. As a result, if one of the apps can work with multiple operating systems, such as Android and iOS, its user base will expand, making the app more popular. According to a study, Android is preferred over IOS because of its ease of use. However, IOS' unique accessibility captivates the majority of users. (Toppo & Dhote, 2021). User reviews are yet another factor that contributes to the popularity of one of the apps. The reviews left by users give others who might be interested in using these apps an opportunity to think about doing so. In addition, app developers frequently consult customer feedback to enhance the quality of their products and increase the satisfaction level of end users. (Aliannejadi et al., 2018; Liang et al., 2015).

Apps that are available for free are given a higher rating. Some apps are classified as free if they do not charge a high fee for the full version or are sufficient for a student to meet his or her learning needs. The cost of an app has a significant bearing on how widely people are willing to use it. The level of risk a user is willing to accept directly affects their propensity to pay for app purchases. It is only natural for customers to use mobile applications developed by different companies even though they serve the same purpose (Furner & Zinko, 2018). Users are less likely to use paid apps if a free alternative is available. The likelihood of a free app having a better alternative increased monotonically as the number of free app downloads decreased. A study shows that approximately one out of every five apps (free or paid) with 500 or more downloads had a better alternative (Taylor & Martinovic, 2016). This is concerning because it implies that the more likely an app was installed by users in the first place, the more likely it had a better alternative that could have been installed instead. Ads are common in free apps and can be inconvenient for users. Understandably, a free app would not last long if it wasn't monetized. Even so, a study shows that app users are less sensitive to the annoyance of advertisement (in free apps) than the payment of app price (in paid apps) because free apps users pay nothing for the service (Chen et al., 2019).

The features of an app for language learning that the language learner priorities are the ones that are the most practical. Steel (2012) explained that access to word definitions quickly is highly valued by students who use language learning applications. Mobile apps were the most helpful in terms of vocabulary acquisition (particularly in terms of memorization, the discovery of meaning, and the application of contexts), as well as reading, writing, grammar, and translation tasks.

**Table 3** Frequency of Apps for learning Korean language appear in the Websites that ranks the top 10 or best apps for learning Korean.

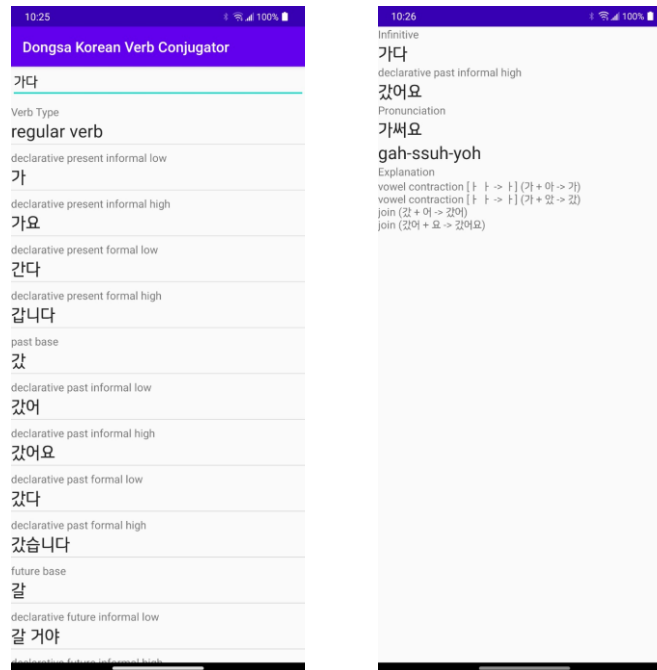
No.	Apps	Frequency more than 2 times	Free Subscription	Practicality of Vocabulary/dictionary feature
11	Dongsa	Yes	Yes	Yes
12	Naver Dictionary+Papago	Yes	Yes	Yes
6	Memrise	Yes	Yes	No
7	Duolingo	Yes	Yes	No
8	Hellotalk	Yes	Yes	No
9	Teuida	Yes	Yes	No
10	Tengugo	Yes	Yes	No
13	Topik One	Yes	Yes	No
1	Lingodeer	Yes	No	No
2	Drops	Yes	No	No
3	Rosetta Stone	Yes	No	No
4	Mondly	Yes	No	No
5	Korlink	Yes	No	No

Findings shows that the Naver Dictionary/Papago and Dongsa were selected as the top two apps based on the aforementioned requirements.

### **Dongsa Apps**

This apps shows Korea verb conjugations for learners of Korean. The word “Dongsa” itself is to mean “verb” in Korean. More than showing vocabulary lists, these apps help users understand Korean vocabulary morphology. Therefore, these apps can still be categorised as apps for vocabulary.

This application was published on November 4th, 2010, on Playstore. The required operating system is Android 4.1 and above. The disadvantage of this application is that it can only be used for the android operating system, not iOS. Based on discussions in several forums on Reddit, it was found that Apple decided to eliminate all 32-bit apps with iOS 11 and force everyone to update to 64-bit apps. Due to that, this application is no longer widely accessed by smartphone users, and they need to use the website if they want to access Dongsa.

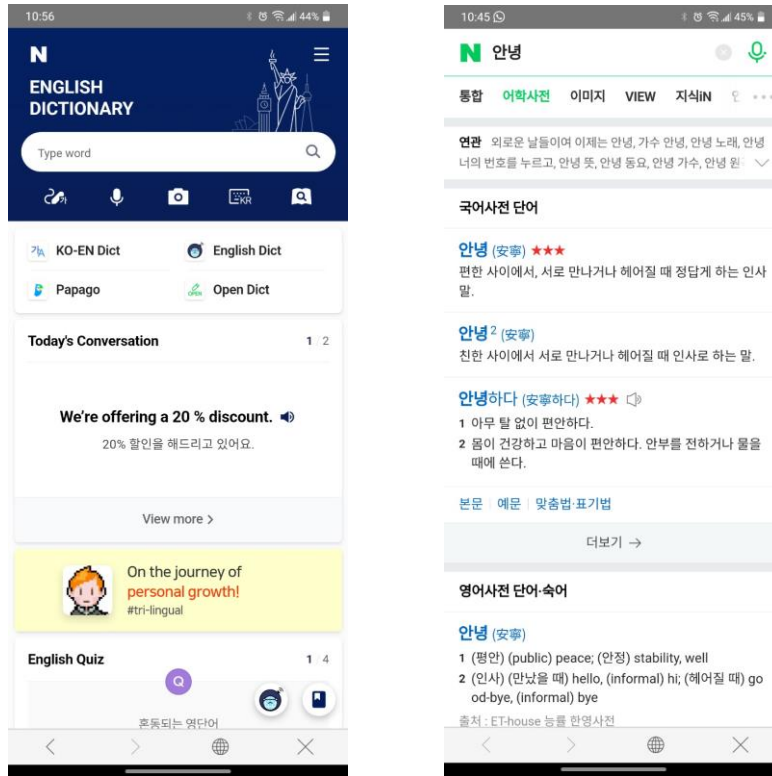


**Figure 1:** Dongsa Apps screenshot taken from LG V60 Smartphone

The app's design is relatively simple. Opening the apps brings you directly to the default search result of “가다”, which means “to do”. A search box on the top can only be filled with known verbs. As the application lacks a dictionary or vocabulary list, it may be challenging for beginners with limited vocabulary. On the good side, the conjugator provides a comprehensive response with addition of pronunciation and an explanation of vowel contraction.

### **Naver Dictionary & Papago**

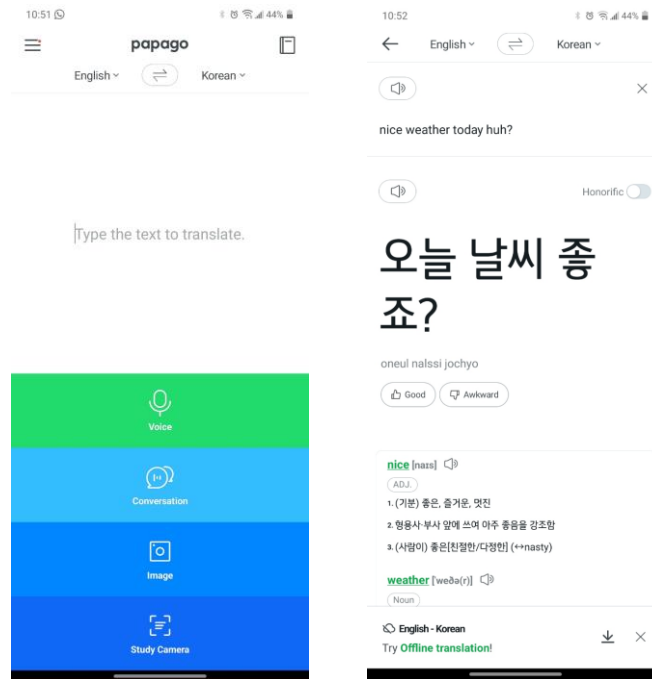
The Naver Corporation operates the Naver internet service in South Korea. It was the first website in South Korea to design and utilise its search engine when it debuted in 1999. Since 1999, Naver has provided dictionary services by providing translations between multiple languages, including English, Japanese, and Chinese. The Naver Dictionary is now available as the mobile application. The Naver Dictionary app is a web app dictionary via which users can access the entire lexical database of a specific online dictionary site, and it supports more than 33 languages (Luef et al., 2020).



**Figure 2 :** Naver Dictionary Apps screenshot taken from LG V60 Smartphone

Meanwhile, Papago works like an extension to the Naver Dictionary. Naver Corporation also produces Papago as a platform for translation. Papago works like a counterpart to Google Translate, where the translation of the entire context of a sentence uses Neural Machine Translation (Yeo et al., 2018). Papago supports 13 languages, among them Korean, English, Japanese, Chinese, and Indonesian. Some of the main features of these apps are text translation, image translation, voice translation, offline translation, conversation translation, handwriting translation, website translation, and dictionaries. This additional feature complements the functionality lacking in the more basic Naver Dictionary app.

Papago is more accepted by many users who focus on Korean for translation than Google Translate. Google Translate is still lagging in data for Asian languages, and these countries prefer to use local company services (Ramirez, 2017). A study shows that many Korean language learners stated they had used Papago translator, YouTube, and Naver dictionary for their learning. These apps are more popular among Korean learners than language learning apps such as Duolingo (Choo, 2021).



**Figure 3:** Papago Apps screenshot taken from LG V60 Smartphone

## DISCUSSION

While Naver Dictionary and Papago offer quick access to vocabulary and sentence translation, Dongsa serves as a conjugator for Korean verb tenses. A dictionary app is preferable to a traditional printed or web portal dictionary. At first, a dedicated dictionary app was preferable to a web portal with dictionaries because the app was faster, could display more complex animation sequences, and had buttons for pronouncing words and sentences. In contrast, a study found that gamified lessons are the most popular feature in language learning apps (Deris & Shukor, 2019). Although Naver Dictionary and Papago do not have such a feature, to justify it, online language learners who enroll in online classes with a planned curriculum should be provided with the necessary vocabulary and should not be required to participate in gamified lessons to learn vocabulary that isn't relevant to their studies. In addition, rather than attempting to shape one's grade, gamified lessons primarily aim to shape one's learning behavior. (Mertala, 2019).

A survey also used to randomly ask among 115 students learning Korean language in Malaysia to gain their perception whether the top two selected Apps is helpful to improve their Korean learning performance. All 115 students were asked to use both apps before they answer the survey.



**Table 4:** Descriptive Statistics on user preferences towards Practicality of Vocabulary / dictionary feature available in Naver Dictionary/Papago and Dongsa apps

	N	Mean	Std. Deviation
P01: I find the vocabulary/dictionary feature in Naver Dictionary/Papago apps is helpful to improve my Korean learning performance	115	4.65	.563
D01: I find the vocabulary/dictionary feature in Dongsa apps is helpful to improve my Korean learning performance	115	4.49	.742
Valid N (listwise)	115		

The mean for both Naver Dictionary/Papago apps and Dongsa apps is helpful to improve my Korean learning performance are more than 4.4 ( 4.65, 4.49 ) which can be considers as high preferences with standard deviation ( 0.563, 0.742).

### CONCLUSION

This research aims to find the top two mobile applications for learning Korean. Rather than language in general, applications that specialise in Korean are focused. Based on the discussion, Naver Dictionary /Papago and Dongsa are the top two most popular applications for learning Korean language among non-native learners. These apps were chosen based on a set of criteria pertaining to their applicability to learning Korean. In conclusion, these two apps are currently the best ideal for learning Korean. This study is anticipated to serve as a resource for app developers in identifying factors that can be used to create or enhance existing language learning apps. This research is limited by the fact that only applications focused toward the Korean language were considered, while other language learning applications, in general, were ignored. It is proposed to utilise studies on gamification in Korean language mobile learning applications for future research.

### ACKNOWLEDGEMENT

The authors would like to thank Universiti Teknologi Malaysia (UTM) for their support in making the project possible. This work was supported by UTM Encouragement Research (Vote No: Q.J130000.3810.19J64)

## REFERENCES

- Ahmad, T. (2020). Student perceptions on using cell phones as learning tools Implications for mobile technology usage in. *PSU Research Review*, 4(1), 25–43. <https://doi.org/10.1108/PRR-03-2018-0007>
- Alfawareh, M. H., & Jusoh, S. (2014). Smartphones usage among university students: Najran University case. *International Journal of Academic Research*, 6(2), 321–326. <https://doi.org/10.7813/2075-4124.2014/6-2/b.48>
- Aliannejadi, M., Zamani, H., Crestani, F., & Croft, W. B. (2018). Target apps selection: Towards a unified search framework for mobile devices. *41st International ACM SIGIR Conference on Research and Development in Information Retrieval, SIGIR 2018*, 215–224. <https://doi.org/10.1145/3209978.3210039>
- Atan, M., & Shahbodin, F. (2018). Significance of mobile learning in learning Mathematics. *MATEC Web of Conferences, March*, 1–5. <https://doi.org/10.1051/mateconf/201815005049>
- Boulos, M. N. K., Wheeler, S., Tavares, C., & Jones, R. (2011). How smartphones are changing the face of mobile and participatory healthcare: an overview, with example from eCAALYX. *BioMedical Engineering OnLine*, 10(1), 24. <https://doi.org/10.1186/1475-925X-10-24>
- Chen, Y., Ni, J., & Yu, D. (2019). Application developers' product offering strategies in multi-platform markets. *European Journal of Operational Research*, 273(1), 320–333. <https://doi.org/10.1016/j.ejor.2018.07.049>
- Choo, S. Y. (2021). *Age and Korean Language Learners' Use of Mobile Applications*. University of Hawai'i at Mānoa.
- Deng, T., Meng, J., Kononova, A., David, P., Kanthawala, S., Peng, W., Hao, Q., & Zhang, Q. (2019). Measuring smartphone usage and task switching with log tracking and self-reports. *Mobile Media & Communication*, 7(1), 3–23. <https://doi.org/10.1177/2050157918761491>
- Deris, F. D., & Shukor, N. S. A. (2019). Vocabulary learning through mobile apps: A phenomenological inquiry of student acceptance and desired apps features. *International Journal of Interactive Mobile Technologies*, 13(7), 129–140. <https://doi.org/10.3991/ijim.v13i07.10845>
- Erickson, B. (1979). Some Problem of from Chain Data. In *Annal of Mathematical Statistics* (pp. 270–302).
- Etikan, I. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Furner, C. P., & Zinko, R. A. (2018). Willingness to pay and disposition toward paying for apps: The influence of application reviews. *International Journal of E-Services and Mobile Applications*, 10(1), 13–33. <https://doi.org/10.4018/IJESMA.2018010102>
- Gangaiamaran, R., & Pasupathi, M. (2017). Review on use of mobile apps for language learning. *International Journal of Applied Engineering Research*, 12(21), 11242–11251.
- Godwin-Jones, R. (2011). Emerging technologies: Mobile apps for language learning. *Language Learning and Technology*, 15(2), 2–11.
- Golshah, A., Dehdar, F., & Imani, M. M. (2020). Efficacy of smartphone-based Mobile learning versus lecture-based learning for instruction of Cephalometric landmark identification. *BMC Medical Education*, 20, 1–8.
- Krejcie, R. V., & Morgan, D. (1970). Small-Samlpe Techniques. *The NEA Research Bulletin*, 30, 607–610.
- Kulesza, J., Li, G. D. H., & Nezlek, G. (2010). More technology, less learning? *Proceedings of ISECON*, 9(December), 4–13.
- Liang, T. P., Li, X., Yang, C. T., & Wang, M. (2015). What in Consumer Reviews Affects the Sales of Mobile Apps: A Multifacet Sentiment Analysis Approach. *International Journal of Electronic Commerce*, 20(2), 236–260. <https://doi.org/10.1080/10864415.2016.1087823>
- Lindner, J. R., & Dooley, K. E. (2008). Journal of International Agricultural and Extension Education: From the Editors. *Journal of International Agricultural and Extension Education*, 15(2), 5.

<https://doi.org/10.5191/jiaee.2019.26105>

- Lowenthal, P. R., & Bose, D. (2016). ScholarWorks Integrating Mobile Devices into the Classroom : A Qualitative Case Study of a Faculty Learning Community Integrating Mobile Devices into the Classroom : A Qualitative Case Study of a Faculty Learning Community. *International Journal of Social Media and Interactive Learning Environments*, 4(4), 319–332. <https://doi.org/10.1504/IJSMILE.2016.081275>
- Luef, E. M., Ghebru, B., & Ilon, L. (2020). Apps for language learning: their use across different languages in a Korean context. *Interactive Learning Environments*, 28(8), 1036–1047. <https://doi.org/10.1080/10494820.2018.1558255>
- Mertala, P. (2019). Wonder children and svictimising parents–preservice early childhood teachers’ beliefs about children and technology at home. *Early Child Development and Care*, 189(3), 392–404. <https://doi.org/10.1080/03004430.2017.1324434>
- Nikitina, L., & Furuoka, F. (2019). Language learners’ mental images of Korea: insights for the teaching of culture in the language classroom. *Journal of Multilingual and Multicultural Development*, 40(9), 774–786. <https://doi.org/10.1080/01434632.2018.1561704>
- Saleh, A., Mosa, M., Yoo, I., & Sheets, L. (2012). A Systematic Review of Healthcare Applications for Smartphones. *BMC Medical Informatics and Decision Making*, 12(67), 1–31.
- Sung, Y., Chang, K., & Liu, T. (2015). The Effects of Integrating Mobile Devices with Teaching and Learning on Students ’ Learning Performance : A Meta-Analysis and Research Synthesis Computers & Education The effects of integrating mobile devices with teaching and learning on students ’ learn. *Computers & Education*, 94(November), 252–275. <https://doi.org/10.1016/j.compedu.2015.11.008>
- Sweeney, P., & Moore, C. (2012). *Categories , Evaluation and Design Mobile Apps for Learning Vocabulary :* 2(December), 1–16. <https://doi.org/10.4018/ijcallt.2012100101>
- Taylor, V. F., & Martinovic, I. (2016). SecuRank: Starving permission-Hungry apps using contextual permission analysis. *SPSM 2016 - Proceedings of the 6th Workshop on Security and Privacy in Smartphones and Mobile Devices, Co-Located with CCS 2016*, 43–52. <https://doi.org/10.1145/2994459.2994474>
- Thakre, S. S., & Thakre, S. B. (2015). Perception of medical students for utility of mobile technology use in medical education. *Int J Med Public Health*, 5, 305–311. <https://doi.org/10.4103/2230-8598.165959>
- Toppo, P., & Dhote, T. (2021). Preference Of Mobile Platforms : A Study of Ios Vs Android. *International Journal of Modern Agriculture*, 2(10), 1757–1764. <http://www.modern-journals.com/index.php/ijma/article/view/912>
- Traxler, J. (2005). Defining mobile learning. *Learning*, September 2004, 261–266.
- Yeo, J., Wang, G., Cho, H., Choi, S., & Hwang, S. W. (2018). Machine-translated knowledge transfer for commonsense causal reasoning. *32nd AAAI Conference on Artificial Intelligence, AAAI 2018*, 2021–2028.