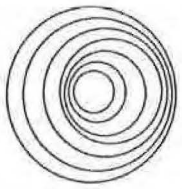

*The IALLT Journal*

*A publication of the International Association for Language Learning Technology*

# THE EFFECTIVENESS OF SMARTPHONE AND TABLET PC APPS FOR JAPANESE LANGUAGE LEARNING

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## ABSTRACT

*The emergence of smartphones and tablet PCs in the second decade of the 21st century has furthered possibilities for mobile learning. The characteristics of smartphones and tablet PC devices such as affinity, portability, accessibility and the availability of low cost applications (apps) with various functions have transformed these devices into a realistic means of learning. In fact, it has been reported that many second language (L2) learners have used such language learning apps and evaluated them positively. The adaptation of mobile apps for L2 language education and training has been actively implemented by not only individual users but also educational and business sectors in many countries. Thus, this study explores the effectiveness of smartphone and tablet PC apps for Japanese language learning, focusing on learners of Japanese at a university in Australia. The types of Japanese language learning apps that students have used and their usage are examined, in order to investigate the effectiveness of such apps. This study aims to provide helpful information to L2 educators and learners about the adaptation of mobile devices to assist their language teaching and learning.*

## INTRODUCTION

Recent developments in technology have brought noticeable changes to learning styles and methodologies. In the second decade of the 21st century, the emergence of smartphones and tablet PCs has brought about further possibilities for mobile learning. The characteristics of smartphones and tablet PC devices such as affinity, portability, accessibility and availability of low cost applications (apps) with various kinds of functions, have transformed these devices into a realistic means of learning. Learning contexts are extremely rich with the use of current mobile devices; thus many studies have been conducted to explore the potential for second language (L2) learning with mobile devices (e.g. Bahrani, 2011; Godwin-Jones, 2011; Kukulsaka-Hulme, 2009; Kukulsaka-Hulme & Shield, 2008). The adaptation of mobile apps for L2 has been actively implemented by not only individual users but also in educational and business sectors in many countries (e.g. Barrs, 2011; Kukulsaka-Hulme & Pettit, 2009; Stockwell, 2008, 2010; White & Mills, 2012). However, there is still little research on how L2 learners actually use language learning apps in detail and how they feel the effectiveness. This study will explore the usage and effectiveness of smartphone and tablet PC apps according to the following research questions, specifically focusing on learners of Japanese as L2. The primary research questions investigated in this paper are:

1) What kind of smartphone and tablet PC apps do learners of Japanese use for their study?
2) How do they use the apps?
3) How do students perceive the effectiveness of these apps for Japanese language learning?

## BACKGROUND STUDY

### *Definition of Smartphone and Tablet PC*

The definition of smartphone is not rigid. Integrated devices of a mobile phone and a small computer as PDA (Personal Digital Assistant) are regarded as smartphones, therefore, mobile phones which were released by NOKIA and BlackBerry in 1990s are also categorized as smartphones (Mitsuyama, 2007). In this study, however, mobile phones which have a touch-panel function with apps like iPhone released by Apple after 2007 are considered smartphones. A tablet

PC is a mobile computer with touch-panel, circuitry and battery in a single unit (Editors PC Magazine, 2010). iPad and Galaxy Note etc. are well-known tablet PCs.

### *Issues of Mobile Learning in the Past*

Mobile learning as a concept is well over a decade old, and the word "MALL" (Mobile Assisted Language Learning) has become quite current. However, mobile learning has had limitations because of technological issues and lack of functions in mobile phones in the past. In 2006, when the current style of smartphones had not yet appeared, Wang and Higgins (2006) described several weak aspects of learning with a mobile phone: small display screen, low resolution, input limitations, the availability of internet access, and lack of standardisation/compatibility (pp. 6-8). In addition, they pointed out that people prefer listening to music rather than studying with their mobile phones during spare time, and studying with textbooks rather than with a mobile phone (2006, p. 4).

### *Suitability of Smartphone and Tablet PC for Language Learning*

Practicality of mobile learning has greatly increased after the appearance of smartphones. To clarify the suitability of smartphones and tablet PCs for language learning, their specific features and how they are applicable for language learning need to be analysed:

(1) Portability (Barrs, 2011; Norman, 2011; Wentworth & Green, 2011) - Smartphones and tablet PCs are light and portable. (2) Variety of functions (McCaffrey, 2011; Wentworth & Green, 2011; Young, 2011) - Multitasking using various functions can be done as well as on a desktop computer. For example, searching a meaning of a word during reading in L2 and adding the word into user's own list are possible using only one device. Smartphones and tablet PCs allow anywhere, anytime access to an ever increasing amount of information and resources through their various functions. (3) Instant accessibility (Kaya, 2013; Norman, 2011) - Users can access them instantly when needed without having to activate a desktop computer or a laptop. Language learning often requires instant searching or recording of necessary information. This feature is considerably convenient for language learners. (4) Sharing function (Kaya, 2013; Norman, 2011) - Users can share learning materials and information through apps and/or social networking sites. It is also possible to ask

questions via the internet. These reasons support the use of smartphones and tablet PCs for language learning. However, these functions are possible thanks to apps that run on these devices.

Okita (2012) examined the factors of learning apps' popularity and found that (1) users are accustomed to online learning, (2) users can effectively use their spare time, (3) smartphone features, which allow users to tap and draw on the screen besides audio/video, reading and typing functions, are suitable for learning apps, (4) there are many free apps, and (5) users can immediately realize the positive effectiveness due to high quality of the apps. In addition, the ability to study through games, to keep study records, to create one's own vocabulary lists and so on appeals to users. Thus, smartphones and tablet PCs with apps hold great potential for language learning.

### *Previous Studies on Smartphone Apps for Language Learning*

A study which was conducted on a group of Japanese students studying English as L2 at a university in Japan found that the students used smartphone apps for checking their English pronunciation, creating their own flashcards, and reading news in English (Barrs, 2011, p. 231). At another university in Japan, 403 Japanese students studying English were surveyed to determine their readiness to embrace smartphone technology, and to gauge their attitudes towards the use of these devices for language learning (White & Mills, 2012). This survey showed that only 11% of students had used their smartphone for English learning. In terms of the apps students utilized, it was only dictionary. However, nearly 50% of students reported that they assumed the use of smartphones could be beneficial to their learning (p. 334). In 2012, a survey targeting 318 smartphone users in Japan showed that more than 50% of the users had downloaded English learning apps, and most evaluated them positively (Okita, 2012).

It is noteworthy that attitudes toward smartphone use for language learning are positive, even if the previous studies reported that not so many L2 learners have used mobile devices for language learning yet. There are cases of individual usage but some studies propose the selection of smartphone apps for teaching in language classes based on an analysis of their suitability (Young, 2011; Kaya, 2013). To provide an insight on the use of new technology for language learning, this study aims to further explore the uses of smartphone and tablet PC apps for Japanese study.

# METHODOLOGY

## *Data Collection and Analysis*

In this study, the data was collected through a questionnaire from Japanese language learners in October 2012 at a university in Australia. In the questionnaire, students from two Japanese language courses were asked if they use or have used smartphone or/and tablet PC apps for their Japanese language learning, the types of apps, their purposes for using these apps, and so on. The data was tallied according to the students' answers to the multiple-choice questions and converted into quantitative percentages. Qualitative data was also collected and analyzed. These results are presented separately in order to discuss the similarities and differences between introductory and advanced level students' app usage.

The second stage of data collection involved interviews to find out more about the students' use of these learning apps. The interviews were conducted with eight students who answered the questionnaire and consented to take part in the research interview. Based on their answers in the questionnaire, further questions on their use and perceived effectiveness of the apps for Japanese learning were asked.

## *Participants*

The questionnaire was administered to two groups of students, a total of 83 Japanese language learners invited to volunteer for the study. Fifty-two learners were enrolled in the introductory level and 31 learners were of an advanced level. The data was collected from the two different groups in order to uncover a variety of app usage, with different outcomes expected at each level of the learners' Japanese proficiency.

Japanese language students who were enrolled in the introductory level have less than one year of Japanese language learning experience, and most of them started to learn Japanese as beginners at the university. Therefore, they have most likely learned Japanese characters, basic vocabulary and grammar structures through their course. Most students in the advanced level started to learn Japanese in primary or secondary school and have often completed at least two years of Japanese at the university. The advanced course is designed to develop

further skills in using both written and spoken Japanese, not only with a textbook but also through the use of authentic materials relevant to current issues in Japan.

For the interview, three students from the introductory level and five students from the advanced level were chosen. Their selection was decided based on the devices and apps they reported using or having used in order to collect a varied sample of participants and data, and to investigate distinctions between different learners, apps, and patterns of use. The participants' pseudonyms and their general information are shown in Appendix 1.

## RESULTS AND DISCUSSION

### *Types of Apps*

The types of devices used by the participants are shown in Table 1 below. The majority of the students use a smartphone, while approximately only 13% of the students at both levels use tablet PC for their Japanese study and less than 20% of students at both levels use a smartphone and a tablet PC.

***Table 1 Types of devices used by participants***

| What kind of device do you use? | Introductory | Advanced |
|---|---|---|
| Smartphone | **67.3%** | **70.9%** |
| Tablet PC | **13.4%** | **12.9%** |
| Smartphone + Tablet PC | **19.2%** | **16.1%** |

The types of apps which are available on smartphones and tablet PCs are quite similar, however, usage may differ depending on the device. One of the advanced level students, Gil, who has both a smartphone and tablet PC, explained that he makes distinctions between each device's role. He uses his smartphone in the classroom as a dictionary, and more frequently than his tablet PC due to its portability, while the tablet PC with its bigger screen is more useful for reading passages and articles, accessing the internet, and for group study. Due to the difference in their purpose of use, he has installed different apps on his smartphone and tablet PC except for general use apps such as a dictionary.

***Table 2 Types of apps used by participants***

| What kind of apps do you use? | Introductory | Advanced |
|---|---|---|

| | | |
|---|---|---|
| **Dictionary** | **90.4%** | **83.9%** |
| ***Hiragana/Katakana*** | **59.6%** | – |
| - Reading + Writing | 38.5% | – |
| - Reading | 17.3% | – |
| - Writing | 3.8% | – |
| ***Kanji*** | **30.8%** | **64.5%** |
| - Reading + Writing + Meaning | 23.1% | 38.7% |
| - Reading + Writing | 0% | 9.7% |
| - Reading + Meaning | 0% | 6.5% |
| - Writing + Meaning | 0% | 3.2% |
| - Reading | 5.8% | 6.5% |
| - Writing | 0% | 0% |
| - Meaning | 1.9% | 0% |
| **Vocabulary** | **44.2%** | **58.1%** |
| **Phrase** | **21.2%** | **19.4%** |
| **Listening** | **19.2%** | **16.1%** |
| **Japanese Language Proficiency Test (JLPT)** | **9.6%** | **19.1%** |
| **Proverb** | **3.8%** | **6.5%** |
| **Grammar** | **0%** | **3.2%** |
| **Others (specified by students)** | | |
| - News in Japanese | – | **6.5%** |
| - Translation | – | **3.2%** |
| - Japanese Keyboard | – | **3.2%** |

Table 2, which shows the percentage of students who used apps of particular types or for particular purposes, clearly indicates that the vast majority of students have Japanese dictionary apps on their mobile devices. A lower percentage of advanced level students own dictionary apps as compared to introductory level students, and this may be due to the fact that more advanced students own a separate Japanese electronic dictionary device besides the apps installed on their mobile device. Advanced students Michael and Alex mentioned that they prefer to use a Japanese electronic dictionary since they have become accustomed to it, and also it has more built in functions. The dictionary apps they have used do not allow them to draw *kanji* to search for the meaning and/or the pronunciation. Due to the lack of such functions, it takes a considerable effort for them to find the needed results, as they have to search for the *kanji* using its *bushu* component (the radical of the *kanji*). Hence, some advanced students prefer to use a Japanese electronic dictionary rather than an app.

Secondly, nearly 60% of the introductory level students studied *hiragana* and *katakana* with assistance from apps outside of their course. (*Hiragana/katakana* learning was not included in the questionnaire for the advanced level students due to its elementary nature.) Since acquiring *hiragana* and *katakana* is fundamental when studying the Japanese language, and because the introductory level students were regularly assessed on *hiragana* and *katakana* in the classroom, many students used apps for spontaneous practice of the characters. Due to the nature of the *kana* learning, there are many apps for *hiragana/katakana* practice, such as some showing stroke order, making the phonetic sound of characters, flashcards, multiple-choice quizzes and so on, meaning that learners can study not only effectively but also while having fun. This anytime, anywhere method is very helpful for language learners and constitutes a significant contribution introduced by the technology.

In regard to the use of *kanji* learning apps, the proportion of introductory (30.8%) and advanced (64.5%) level students showed a significant difference. However, this is understandable when considering the higher complexity and number of *kanji* introduced in the advanced level. Other apps used by several students included vocabulary learning apps. Since remembering and knowing new vocabulary items is a significant element of language learning, many apps for vocabulary learning exist in various styles, such as category and game based apps.

Other specific apps, such as those for JLPT practice and proverb learning were used by fewer than 20% of students. However, the study found that "grammar", which is another important aspect of L2 learning, is hardly studied using apps, although such apps are available. Some of the students interviewed stated that usually grammar learning apps have more descriptive content which is not ideal to read or cannot be displayed fully on the device's small screen. They provide an experience similar to reading a textbook or an essay; thus students do not prefer them. One participant, Dale, clarified "The most useful and fun apps are quiz ones because I can play game and learn. But I don't feel like reading too much explanation about grammar with my mobile. If I need lots of explanation, I'll read a textbook". From this point of view, it can be observed that the smartphone and tablet PC apps for Japanese learning tend to be used as a means for instant searching and quick practice rather than obtaining and consolidating knowledge by reading explanations. Some examples of the apps available for different mobile device operating systems are shown in Appendix 2.

***Table 3 Cost of apps***

| Are the apps free or paid? | Introductory | Advanced |
|---|---|---|
| Free apps | **82.7%** | **74.2%** |
| Paid apps | **1.9%** | **6.5%** |
| Free + Paid apps | **15.4%** | **19.4%** |

Table 3 shows the percentage of apps used by the participants based on their cost. The majority of the students use only free apps. Many free apps usually have either time or access limitations, offering only the first few parts of the contents for free with additional contents available for users to purchase. However, either free or paid dictionary type apps allow users to permanently use them once downloaded without any restriction. Nevertheless, most students feel satisfied with the accessible content available in the free apps and did not choose to pay for any additional contents. An advanced student, Sophia, cited the regular introduction of new apps in her device's app store as a primary reason not to pay for apps.

On the contrary, there are noticeable differences between paid and free apps pointed out by the users who have used both types of app. A beginner student, Dale, expressed the opinion that free apps for Japanese learning are beneficial but simple, while paid apps are more attractive due to their greater depth of content and more varied features, such as sound, pictures, drawing and so on. An advanced student, Alex, explained that paid dictionary apps are more practical for *kanji* searching since these apps allow users to draw *kanji* and recognize *kanji* by taking a photo of the symbols. Gil also pointed out that the *kanji* database on most free apps is less complete due to the limitations on the number of words, and furthermore, there are often no samples of usage demonstrating the word in a sentence. For L2 learning, it is important to know how words are used in context, especially when the words have multiple meanings or if they have different meanings depending on the usage. Due to the lack of such features in many free apps, some learners regard the paid apps as more effective and valuable.

Although the participants from both levels expressed their satisfaction with free apps and also acknowledged the benefits of paid apps, the results from the survey show slightly different percentages. The percentage of students at the introductory level using free apps is higher than at the advanced level, but paid apps and free+paid apps are used by a higher percentage of advanced learners. This would likely be because most free apps are aimed at beginners, and it may be the case that advanced learners, who have invested more time and effort into their Japanese study, are more likely to invest in paid apps.

The main purpose for using smartphone and tablet PC apps for many students was to assist their Japanese study for the unit they are enrolled in at the university. However, more than 90% of advanced students have actually made use of the apps in their Japanese unit, while less than 70% of introductory students have used them for their course study. This appears mainly related to the difference in the level of difficulty of the two courses, for example the number of required vocabulary and *kanji* is greater in the advanced level, leading to more need for the apps.

### *Usage of Apps*

***Table 4 The purposes for using apps***

| Why do you use the apps? | Introductory | Advanced |
|---|---|---|
| **To assist Japanese study for the unit taught at the university** | **69.2%** | **90.3%** |
| **To assist general Japanese study (Not directly related to the unit at the university)** | **25.0%** | **64.5%** |
| **Preparation for tests** | **25.0%** | **45.2%** |
| **For fun** | **48.1%** | **38.7%** |
| **To check Japanese proficiency** | **23.1%** | **19.4%** |
| **Others** | | |
| - To communicate with Japanese friends | **1.9%** | **6.5%** |
| - To read Japanese articles | – | **3.2%** |
| - To look up Japanese culture | – | **3.2%** |
| - To watch Japanese animations | – | **3.2%** |

Advanced students are normally capable of handling more things in Japanese than beginners due to higher levels of Japanese language proficiency. Therefore, it was expected that advanced students would use apps more for fun, however, the result was contrary to the expectation. The other reasons for advanced students in using mobile apps ranked in order are; "to assist general Japanese study" (64.5%), "preparation for tests" (45.2%), "for fun" (38.7%), and "to check Japanese proficiency" (19.4%). In the introductory level, on the other hand, "for fun" (48.1%) was ranked as second, both "to assist general Japanese study" and "preparation for tests" were third (25.0%), and "to check Japanese proficiency" (23.1%) was the last.

Some advanced students in the survey responded that they often read Japanese articles with their mobile devices to gather knowledge and improve their Japanese abilities even if it is not directly relevant to their course content as

it is somehow helpful for their course as well. Moreover, a few of the students reported that they were intending to take the JLPT; thus, they use the apps to practice for the test.

***Table 5 Time for using apps***

| When do you use the apps? | Introductory | Advanced |
|---|---|---|
| In classroom | **13.5%** | **61.3%** |
| During self-study outside classroom | **59.6%** | **83.9%** |
| During travelling | **25.0%** | **38.7%** |
| During free time | **55.8%** | **35.5%** |
| During chatting with Japanese friends | **3.8%** | **3.2%** |
| Before exams | – | **3.2%** |
| When forgetting Japanese words | **1.9%** | – |

Table 5 shows when students use apps. Corresponding to the purposes of using apps, the results show that the majority of advanced students use apps for self-study outside the classroom (83.9%) and/or in their Japanese classes (61.3%), while 55.8% of the introductory students use them in their spare time.

***Table 6 How users acquainted with the apps***

| How did you get to know about the apps? | Introductory | Advanced |
|---|---|---|
| While browsing the device app store | **69.2%** | **80.6%** |
| From friends | **21.2%** | **35.5%** |
| From teachers | **30.8%** | **25.8%** |
| While browsing with a computer | **5.8%** | **3.2%** |

Most participating students became acquainted with the apps via the app store search on their smartphone and/or tablet PC. This confirms that the adoption of apps for learning is natural for users and that mobile devices provide a reasonable learning space.

### *The Effectiveness of Apps for Japanese Language Learning*

In regard to the effectiveness of learning apps, 67.3% and 83.9% of students from the introductory and advanced level respectively felt that apps were effective and helpful for their Japanese learning. The breakdown of these results are presented in Table 7 below.

***Table 7 The effectiveness for Japanese language learning***

| How do you feel about the apps? | Introductory | Advanced |
|---|---|---|

| | | |
|---|---|---|
| Very effective | **11.5%** | **19.4%** |
| Effective | **55.8%** | **64.5%** |
| Neutral | **28.8%** | **12.9%** |
| Not so effective | **1.9%** | **3.2%** |
| Not effective | **1.9%** | **0%** |

The qualitative questionnaire results also show that users do perceive benefits of using such apps to assist in their Japanese learning. The list below shows the major reasons that were expressed by the users in regard to the effectiveness of apps.

**< Introductory level >**

- Accessibility
- Handiness
- Supportive for the university course
- Fun learning

**< Advanced level >**

- Accessibility
- Handiness
- Quick response of dictionary apps
- Availability of making own vocabulary/*kanji* lists

Accessibility and handiness were highlighted in the participants' responses from both levels, which indicates that technological convenience is one of the main reasons for the increasing popularity of learning apps. In addition to those reasons, introductory students indicated that practicing *hiragana/katakana* with the apps assisted their memorization of the characters and aided them in improving their course assessment results. Dale mentioned that the apps provided beneficial functions which can be configured via the in-app settings, such as result records, and repeating the same questions that were previously mistaken so that the users could remember them better. It is somewhat uncertain whether it can be conclusively shown that "fun learning = effective learning", but "not feeling bored" must be an important aspect affecting learners' motivation. Another beneficial function pointed out by advanced students was the ability to organize their own vocabulary/*kanji* lists. Some of the students have used similar programs on their desktop computers or on a comparatively heavy laptop, which were less convenient for spontaneous learning or revision. Now, due to the availability of apps on their mobile devices, users appreciate that they can bring, use, and arrange their own lists anytime and anywhere.

It can also be seen that some students answered "neutral" in response to the apps' effectiveness. One of the introductory students, Chris, had tried several apps and found learning apps to be useful in assisting his study, however, he felt

that the degree of usefulness is related to the quality of the apps. From this point of view, it can be seen that users have different expectations for apps content and how they hope it will assist them in their study. An advanced student, Tim, who also responded neutrally about the apps' effectiveness, explained that apps are useful for general Japanese study but the contents of most available apps are not directly relevant to his Japanese course content. This observation is further strengthened by the fact that most mobile apps for smartphones and tablet PCs are not designed for a particular course but are mostly general apps designed for generic study by anyone. Therefore, only general apps which are relevant to essentially any learner such as dictionaries, *hiragana/katakana*, *kanji* apps etc., or specific apps which contain textbook databases may be effectively used for their enrolled units and perceived as useful. Naturally, there can be no apps that perfectly correspond to a particular course content at a university, as textbooks are often supplemented with additional materials, and teaching pace and coverage of content differs between institutions. Thus, these reasons may explain why generic apps do not suit some aspects of course work.

Furthermore, the students pointed out that "more input systems" are required for Japanese learning purposes. Many apps for language learning provide quizzes using multiple-choice questions. This instant practice is valued and enjoyed by many users. Yet, students are required not only to select answers but also to write and perform other tasks in their classrooms and real life. Students who have struggled with writing *kanji* found that they could read and understand the meaning of *kanji* but often forgot how to write them since they had studied only kanji recognition because of lack of drawing function in their apps. This is an important point for consideration when selecting or developing learning apps. Though one of the advantageous features of smartphones and tablet PCs is their touch-screen, tap and drawing functionality, these methods are considerably new to computer-human interaction, and are, to date, underutilized - there are still many apps which do not adopt such features despite the capacities of the devices they are designed for. The purpose of using learning apps for many students is facilitating not only recognition but also production; thus this aspect should be seriously taken into consideration as production is a key aspect in language learning and its incorporation should be focused upon in future language learning apps.

Only a few students regarded the Japanese learning apps negatively. However, their reasons were largely due to unfamiliarity with the smartphone itself, and feeling more comfortable studying with devices or materials that they are accustomed to using, like textbooks and/or electronic dictionaries.

## CONCLUSIONS

This study has explored the use and the perceived effectiveness of smartphone and tablet PC apps for Japanese language learning, specifically focusing on introductory and advanced level learners who have studied Japanese at a university in Australia.

The study found that the major purpose of using apps for many students at both beginner and advanced levels was to assist their Japanese study related to their course. However, there are no apps which perfectly cover their course content; thus, students report using general apps such as a dictionary, *hiragana/katakana*, *kanji*, and vocabulary learning apps to support their Japanese learning. Many students are satisfied with free apps but adoption of more practical functions using advantageous features of smartphone/tablet PC is desirable. If the systems are implemented in more Japanese learning apps, many more users might find satisfaction in using them for their study.

Regarding the effectiveness, the study discovered that the majority of the students feel that apps are effective in assisting their Japanese learning. In addition to technological convenience, positive reflections on their course study were given as the reasons for the apps' usefulness by students.

The data collected for this study is limited; thus the findings discussed here cannot be regarded as universally applicable. However, it is hoped that the suggestions made throughout will be of use in the development of future apps in order to create apps that are more effective as study aids for Japanese language learners, and as devices and software advance further.

## ABOUT THE AUTHOR

**Fusako Ota** graduated from Doshisha University in Japan, after which she commenced studying and teaching Japanese as a foreign language in Australia. She started to research on Computer Assisted Language Learning (CALL) while undertaking Master of Applied Japanese Linguistics course at Monash University. She has been teaching Japanese at Monash University for several years. Currently she is particularly interested in language learning through applications (apps) of mobile devices.

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# APPENDIX 1

***Appendix 1***

***Information of the participants (interviewees)***

| **Participants' name** | **Marc** | **Chris** | **Dale** | **Alex** | **Sophia** | **Michel** | **Tim** | **Gil** |
|---|---|---|---|---|---|---|---|---|
| **Level** | **Introductory** | | | **Advanced** | | | | |
| **Duration of Japanese study** | 3 months | 3 months | 3 months | 10 years | 8 years | 4 years | 10 years+ | 10 years+ |
| **Device(s)** | Smartphone | Tablet PC | Smartphone + Tablet PC | Smartphone | Smartphone | Smartphone | Tablet PC | Smartphone + Tablet PC |
| **Cost of apps** | Free | Free | Free + Paid | Free +Paid | Free | Free | Free | Free + Paid |
| **No. of apps** | 1 | 3 | 10 | 4 | 6 | 3 | 4 | 5 |
| **Types of apps** | Dictionary | Dictionary<br>Phrase<br>Grammar | *Kana*<br>Vocab<br>JLPT<br>Grammar<br>Listening<br>Reading | Dictionary | Dictionary<br>*Kanji*<br>Proverb<br>Chat | Dictionary<br>Vocab<br>Phrase | *Kanji*<br>JLPT<br>Proverb | Dictionary<br>*Kanji*<br>Vocab |
| **Effectiveness** | Very effective | Neutral | Very effective | Neutral | Effective | Not so effective | Neutral | Effective |

# APPENDIX 2

***Appendix 2***
***Samples of different types mobile apps for Japanese learning***

| Operating System | Android based | Apple based | Blackberry based | Windows based |
|---|---|---|---|---|
| **Dictionary Apps (English↔Japanese)** | ColorDict<br>JED<br>Jishokun | Japanese My Way<br>Midori<br>Naver Dictionary | Audio Collins J-E Dic<br>BEIKS J-E Dic<br>DW J-E Dic | Eng-Japan Dictionary<br>JDIC<br>Tango Master |
| **Kana Learning Apps** | Hiragana Learn Experiment<br>Jalaga<br>Katakana Learn Experiment<br>Kana Draw<br>Obenkyo<br>Vanilla Kana Flashcards | Hiragana and Katakana<br>Hiragana Pixel Party<br>Kana Card<br>Match Kana<br>TenguGo Kana | HiraKana<br>Hiragana Trainer<br>Kana Pro<br>Kana Trainer | Hiragana Pixel Party<br>Japanese Hub<br>Obenkyo |
| **Kanji Learning Apps** | Kanji Flashcards<br>Kanji Recognition<br>Kanji Senpai<br>Kanji Writing Game<br>Obenkyo | Juku Kanji<br>KanjiBox<br>Kanji Flip Kanji Renshuu<br>Kanji Stories<br>Skritter | Kanji Draw<br>Kanji Match<br>Obenkyo | Daily Kanji<br>Japanese Hub<br>Kanji Book |
| **Vocabulary Apps** | Goi Trainer<br>Japanese Vocabulary<br>Kotoba<br>Survive Japanese<br>Word of the Day | iStart Japanese<br>i-Sokki Japanese Vocab<br>Japanese Flashcards<br>Japanese Study Buddy!<br>StickyStudy | Instant Japanese<br>Japanese Vocabulary<br>Learn Japanese | Japanese Hub<br>Japanese WOTD<br>Tango Master |
| **Grammar Apps** | Bunco<br>Human Japanese<br>Japanese Flashcards<br>JA Sensei<br>Obenkyo | Gengo Grammar<br>Human Japanese<br>iStart Japanese<br>Japanese Flashcards<br>J-Grammar | Japanese Lessons + Flashcards<br>L-Lingo Japanese<br>Obenkyo | Human Japanese<br>Obenkyo<br>Tango Master |
| **JLPT Apps** | Japanese (JLPT N1-N5)<br>JLPT N1-N4<br>JLPT Vocabulary NihongoUp | Gengo Grammar – Japanese<br>Japanese (JLPT N1-N5)<br>Juku JLPT | Kanji Draw JLPT<br>NihongoUp<br>Obenkyo | DJapan<br>JLPT Flashcards |
| **Other Apps** | Anime Japanese Free Class<br>Japanese Verbs<br>Learn Japanese on your Android<br>Learn Japanese Phrasebook<br>Speak Japanese Free | Japanese Saying<br>Learn Japanese Phrasebook<br>Learn Japanese Phrases | EnJaTran<br>JapaneseNews<br>Japanese Translator<br>Japanese Wisdom Words<br>JIME | Japanese Dialogs<br>Japanese Phrasebook<br>Japanese Reader<br>Write Japanese! |