

## Development of INSVAGRAM: An English Subject-Verb Agreement Mobile Learning Application

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John Paul Palo Miranda<sup>(✉)</sup>, Roque Francis Badajos Dianelo, Alvin Miguel Yabut,  
Charles Anthony Lacson Paguio, Arjie Geronimo Dela Cruz,  
Harvy William Gunayan Mangahas, Kim Cardenas Malabasco  
Don Honorio Ventura State University, Bacolor, Philippines  
jppmiranda@dhvsu.edu.ph

**Abstract**—English language proficiency of students in the Philippines is a point of concern by many institutions particularly as it was highlighted when the results of the first participation of the country in the Program for International Student Assessment (PISA) was released. The use of technology-aided educational applications dedicated to language learning, particularly those that can be accessed through mobile devices, is heavily studied internationally. However, in the Philippines, there is a limited number of developed mobile-supported applications that assist acquisition and learning of language, specifically English. Thus, the study aims were to develop a mobile learning application intended to assist students in learning a least mastered topic in English. The study utilized mixed-method descriptive research design. For the quantitative part, it employed a content-validated questionnaire to survey 132 fifth grade students, while for the qualitative part; it interviewed five English language teachers in the Philippines. A mobile learning application intended for smartphones in an Android OS was developed with focus on subject-verb agreement (SVA) as identified topic which was divided into 10 sub-topics. The application comprises two main parts: The Learn and Play Mode. Additionally, the application was also able to integrate an animated character named *Alvin* to simulate interaction. *Alvin* interacts with the user by narrating lessons, giving remarks, providing basic corrective feedback in the form of text, and expressing feelings based on the user's inputs when doing exercises. The survey from students aged 10 to 12 years old showed that they have very often access to technological devices (i.e., desktop, laptops, tablet, smartphone) ( $M = 4.33$ ) and that their technology aptitude in using them is high ( $M = 3.45$ ). Furthermore, results also showed that students mostly prefer smartphones for their learning as it is their most available device at home. It is recommended to subject the developed mobile application to a user acceptance and usability testing in different educational contexts. Additionally, it is suggested to explore newer technologies like artificial intelligence to make the application intelligent and more responsive to students' needs and inputs. Future studies may also include addition of new topics as well as developing similar applications that are localized and culturally-aware.

**Keywords**—mobile learning application, mobile-assisted language learning, English, subject-verb agreement, software development

## 1 Introduction

English is the world's recognized lingua franca for being used to communicate with other nations after the world unites into a global community [1]. English has become the official medium of instruction, language used for some major academics, and in businesses for other English-speaking countries like the Philippines [2], [3]. People from different countries can communicate better than how they imagine because of the assistance of modern technology and the use of English as a lingua franca and this has a huge impact on daily lives in the present era [1].

The Philippines is one of the English-speaking countries in the world because of being an English friendly society [4]–[6]. Despite recent proposals to convert it to "Filipino," English remains the most frequently required subject in Philippine school and college curricula. The fundamental reason is that the general public and educational authorities have consistently shown their support. The prevailing consensus is that a good command of the English language is the most valuable asset of the aspiring Filipino who recognizes the needs of modern times in modern nations. Students in the Philippines believe that there must be a Philippine dialect of English, neither British nor American, but a regional dialect. It is possible to dissent in favor of "Filipino English" in the Philippines, but it is a source of linguistic shame outside the nation, particularly in the US and the UK. Matching the correct verb with its subject is one of the most fundamental grammatical rules. However, due to the enormous number of options available, whether singular or plural, it appears to be quite difficult.

The Coronavirus pandemic has disrupted everything in multiple and unprecedented ways, resulting in interruptions to many industries as well as fueling and widening existing inequalities [7], [8]. One of the most affected is the education system. As much as the academe would want to conduct face-to-face sessions, due to the threat of the pandemic, schools opted to conduct online classes. Consequently, there may be advantages and disadvantages for this kind of learning modality particularly to developing countries like the Philippines. Digital resources, on the other hand, can equip learners with more than simply the capacity to go to school. Digital access keeps people connected to others and has become an essential resource for maintaining ties during a time when everyone is forced to be apart. It is more important than ever to keep learners in school, connected, and supported. As of date, 73 percent of Filipino students now have a laptop computer or smartphone, and 90 percent of our students have returned for the 2020-2021 academic year as reported by the Department of Education.

In 2015, a roundtable of various stakeholders, organized by the British Council in the Philippines, highlighted the decline in the English proficiency among Filipinos [9]. After three years, the first participation of the Philippines in the Program for International Student Assessment (PISA) was recorded – 2018. PISA is a global study, initiated and organized by the Organization for Economic Cooperation and Development (OECD), aims to measure the academic performances of the participants, 15-year-old students, in areas of reading, mathematics, and science. The concluded PISA 2018 was participated by OECD members as well as non-member nations – tallying 79 countries in total. Thus, the aim of the test is to offer comparable data that

would each country a chance to benchmark its education system against other countries in order to improve, enhance, and recalibrate on education policies, practices, objectives, and aims [10]. Apparently, Filipino pupils took part in PISA for the first time. It will be Filipino students' first opportunity to be compared to their global counterparts using this well-known metric. The outcomes, it appears, were abysmal [11]. The Philippines came in dead lowest in reading out of 79 countries or economies, and second last in math and science (beating only the Dominican Republic) [12]. Having this result, it could be noted that one of the possible reasons is that affluent pupils can outperform poor pupils. Hence, other findings are also a very peculiar problem in the Philippine Education [11]. It is argued that comparing the Philippines to the OECD member countries, especially those with the most advanced economies, is unfair. On the contrary, a lack of a general vocabulary or framework for understanding the nature of knowledge and skill development across discipline continues to be evident at most schools in our country [13].

The advent of globalization for the past years has had a considerable impact to the Philippine economy in general and to the educational system in particular. Because of the dynamic changes in national and worldwide labor markets, educational institutions must deal with the development of employability skills as a provider of manpower to local and international businesses. Through access to knowledge, connection with peers' expertise, and opportunity for simulated and real-life experiences, the integration of technology-aided supports that place the learner at the center of a process removes the limits of the traditional classroom. As a result, educational institutions generate graduates with essential employability skills like communication, as well as abilities like discovering needed information and collaborating effectively.

According to curricular changes, faculty members are currently being impacted at a rapid rate, and in order to avoid being left behind, they must be flexible enough to adapt to the latest trends and technological breakthroughs in methodologies, theories, and practices. Teachers must prepare their students with the values, skills, knowledge, and attitudes necessary in facing challenges in a multipolar, complex, and interdependent world order. The most well-designed curriculum or program is nearly certain to succeed in the hands of dedicated and effective teachers. Academic institutions should explicitly tailor their curricular offerings to meet the needs of the economy, in order to make them relevant and responsive to local and worldwide labor markets.

### **1.1 Research objectives**

The study aims to develop a mobile learning application that could assist students in learning the English language. In order to achieve this, the study has the following objectives:

1. Determine which specific topic in English language taught in basic education is the least mastered according to the teachers.
2. Identify the profiles of the students in terms of:
  - a) Access to technology;
  - b) Technology aptitude;
  - c) Most preferred device; and
  - d) Most available device at home.
3. Develop a mobile learning application that could support the students in learning the identified topic.

## **2 Literature review**

The educational benefits of using mobile technologies for English language learning are often explored under mobile-assisted language learning (MALL) [14]–[17] and mobile-learning (m-learning) (e.g., [18]–[21]). For mobile learning applications, one of its main benefits is its mobility and portability [16], [18]–[20]. As shown, most students who owned mobile devices used their mobile application for language learning at the comfort of their home [22]. Furthermore, in 2019, Kacatl and Klímová reviewed original papers focused on mobile learning applications intended for English language. Kacatl and Klímová determined that mobile learning can support learners' cognitive capacity and improve their motivation in both formal and informal settings.

Through a study, Zou and Li [23] revealed that enjoyment in using mobile learning applications among learners also indicates significantly high motivation particularly on the conduct and integration of learning practices in their mobile application. The high motivation among learners in using an application for language learning is also supported in the study of Klimova and Zamborova [15], Idres et al. [24], and Rezaei et al. [25]. In addition to this, Baleghizadeh and Oladrostam [14] pointed out that mobile phones are vital towards improving speaking quality among students learning English language, particularly among developing countries. In support of this, Sila Ahmad et al., [21] and Rezaei et al. [25] reported a positive impact of mobile applications towards enhancing language learning among students. Moreover, student perception on its usefulness and their intention to use such applications can improve over time [26].

Another salient feature that students found to be helpful in assisting their language learning through mobile application is its capability to interact with the user [27]. This is seen in the study of Poggiali [28] to which the findings showed that learners exhibited enthusiasm when animation is also applied as a medium of instruction. Additionally, animated visual cues and customized media content as pedagogical tools can simulate student interest in the learning process [29], [30]. For example, one study in the Philippines showed that a developed mobile game intended for basic English language learning can improve student performance particularly in vocabulary, spelling, and grammar [31].

While the potential of using mobile application for language learning has also been explored in many studies (e.g [15], [27], [32]) and its development has also investigated

in international setting, few studies have been conducted focusing on its developmental side particularly in the Philippine context; much more on developing applications intended to improve specific language topics (e.g., least mastered topics in English). Some of the works are usually focused on speaking [33], [34] and vocabulary [35], [36].

### 3 Methodology

This study partially adapted and revised the mixed-method descriptive research design employed by Bringula et al. [37]. As mentioned in the study of Alsharida et al. [38], mixed-method research design is helpful to better understand users' context. The study then employed a content-validated questionnaire (i.e., asking the opinions of three language experts) which aimed towards understanding the profiles of fifth grade students in terms of their access to technology (i.e., desktops, laptops, tablets, and smartphones), aptitude in using these technologies, most preferred device for learning, and most available devices at home. Purposive sampling technique was used for the reason that most fifth graders are at-home and not allowed to go outside due to the implementation of lockdowns and strict quarantine guidelines in the Philippines. Selection and identification of respondents are done through their peers and social networks like teachers, parents, and classmates. A Likert scale was also used for the questionnaire. The development of the mobile application was guided by the initial results. For example, the most available device in their home is considered to which the application is developed. For the qualitative part, the study will conduct a series of virtual interviews to fifth grade English language teachers in the basic education to identify the least mastered topic. The results of the interviews also served as a guide for the design considerations of the application. Each interview lasted about 30 minutes to an hour. A follow up interview was also conducted for further clarifications. It is also worth mentioning that face-to-face interviews were not conducted for the same reason that there are on-going lockdowns and strict quarantines being implemented in the Philippines during the conduct of the study.

### 4 Results and discussion

The study was able to survey 132 fifth grade students – age ranged from 10 to 12 years old. Based on the result of the survey, the respondents very often have access to technology (i.e., desktops, laptops, tablets, and smartphones) ( $M = 4.33$ ). The respondents are also highly knowledgeable in terms of their technological aptitude for using such devices ( $M = 3.45$ ).

**Table 1.** Profiles of Fifth Grade Students

Initial Information	Mean (M)	Verbal Interpretation
Access to technology	4.33	Very often
Technology aptitude	3.45	High knowledge

Additionally, when the respondents were asked about their preference and most available device at home, 71.2% of the respondents (Figure 1) said that their most available device is a smartphone, while their least available is a tablet. The same pattern of results emerged when the respondents were asked about their most preferred device to use for learning, it showed that 64.4% are for a smartphone (Figure 2) and only 6.8% are for tablet. In 2020, it was forecasted that by 2021, with its current growth, estimates that there will be 82.33 million Filipino smartphone users in the Philippines [39]. Additionally, it was also reported that in the Philippines, 86% of Filipinos have increased their smartphone usage during the start of the Covid-19 pandemic [40]. For market share of mobile operating systems (OS), Statista and Statcounter both reported the dominance of Android OS in the country which translates to about 8 out of 10 Filipino using the OS in their smartphone [41], [42]. For these reasons, the developed mobile learning application is primarily intended for an Android OS as its platform.

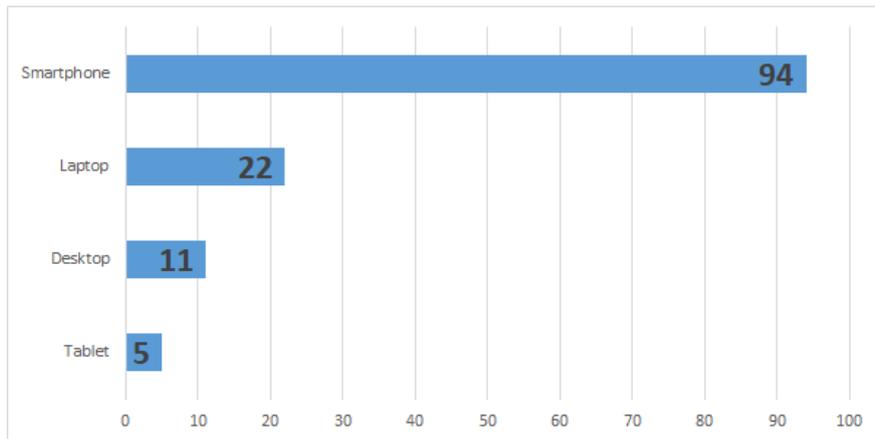


Fig. 1. Respondents' most available device at home

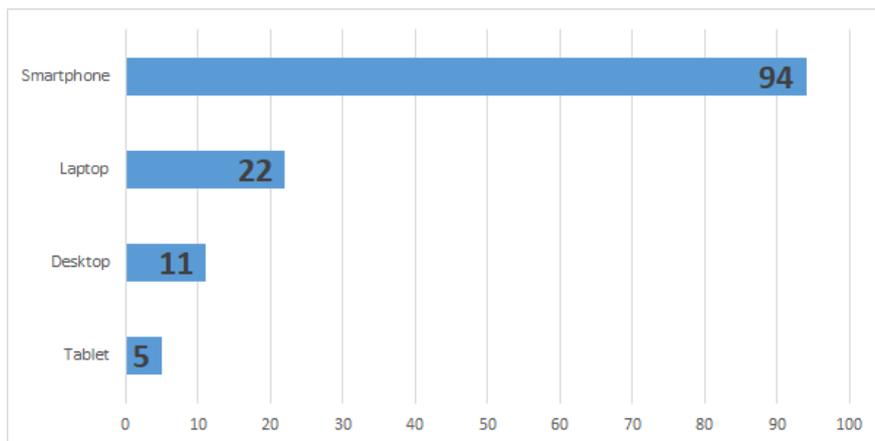


Fig. 2. Respondents' most preferred device to use

The study was able to identify that one of the least mastered topics in English language education, after a series of interviews among the five fifth grade English teachers, is subject-verb agreement. This finding is also supported in multiple studies, for example, in the study of Sioco and De Vera [1], it was concluded that grammatical competence of students in terms of subject-verb agreement is average which led them to further recommend that a supplemental learning material must be provided to students in order to improve their competence on the topic. Another study by Sumalinog [43] revealed that observing the correct usage of subject-verb agreement is among the common grammatical errors made by Filipino learners as observed by their English teachers. Additionally, in a more recent study, understanding subject-verb agreement also emerged as one of the least mastered topics in English among Filipino learners [44]. With this, the content focus of the mobile learning application is on subject-verb agreement.

In the developed mobile learning application, on startup, the user is greeted with a welcome screen (Figure 3) that requires the user to provide a username so the animated character named *Alvin* can address the user properly. Initial features of the application include the ability to modify its audio settings (i.e., adjusting music, sound, and voice volume) (Figure 3). The music and sound volume are intended for the background music, application's response from clicks, and completion indicators (Figure 5) that are all integrated throughout the application. On the other hand, the voice volume is intended for *Alvin* as he guides the user throughout the interaction in the application. Additionally, the application also provides tips each time the application loads or transitions to another section (Figure 3).



Fig. 3. Welcome screen, application settings, and loading tips

The application comprises two (2) main parts, the Learn and Play mode. In the Learn mode, the students are presented with 10 lessons (Figure 4) about subject-verb agreement (Table 2). Based on the themes from the interviews with the teachers, a locked function was added to ensure that students must first learn the lesson in Learn mode and answer at least 50% of activities in the Play mode correctly before proceeding to the next lesson. Star points are given when a lesson is finished (Figure 3). Extra games in the form of activities can be unlocked once the user accumulated the required star points (Figure 4).



Fig. 4. List of available lessons and games for each SVA concepts

**Table 2.** Content of the Application

Lesson	Title	Coverage
0	Basic SVA Rule	Provides a brief discussion about sentence construction in relation to subject and verb agreement.
1	Rules on “Either or” and “Neither nor”	Aims to provide knowledge in the SVA with connectors either, or, neither, and nor.
2	Rules on Connector “And”.	Aims to provide knowledge on the correct usage of verb with the connector “and”.
3	Rules on Intervening Phrases and clauses	Designed to provide correct information with regard to intervening clauses that may affect the sentence construction.
4	Rules on 1st and 2nd Pronouns	Aims to provide basis knowledge in the usage of SVA with the Pronouns 1st person and 2nd person.
5	Rules on Indefinite Pronouns	Provides knowledge with regard to the usage of verbs in a sentence containing indefinite pronouns.
6	Rules on Modified Subjects	Provides knowledge on the correct usage of verbs with subjects modified by each, every, and no.
7	Rules on Collective Pronouns	Aims to provide knowledge on the correct usage of verb in relation to collective pronouns stand as one and vice versa.
8	Rules on Unit of Measurement	Provides knowledge on the correct usage of verb dealing with unit of measurement of time, distance money, weight and others.
9	Rules on Title of works	Provides knowledge on the correct usage of verb with title of books, movies, novels and other similar works.



**Fig. 5.** Unlocking, notification, and congratulatory remarks by Alvin

Figure 6 shows *Alvin* narrates the lessons (Figure 6), provides basic corrective feedback in forms of text (Figure 7) and a variety of static expressions (e.g., Figure 7). The actual lessons narrated by *Alvin* are provided with visual cues to help the user understand the topic at hand. For the expressions, an example of these is a very fiery enthusiastic expression accompanied with a text "Fantastic" is shown by *Alvin* when the user answered seven exercises in succession (Figure 7). These features were added to engage the user when using the application. Such a feature is found to be helpful as a pedagogical feature of an application particularly in language learning [27], [28], [30]. Additionally, a skip and forward feature (i.e., buttons) is added only when the user finishes the lesson once. This allows the user to skip or forward the lesson easier if wanted to revisit the lesson.

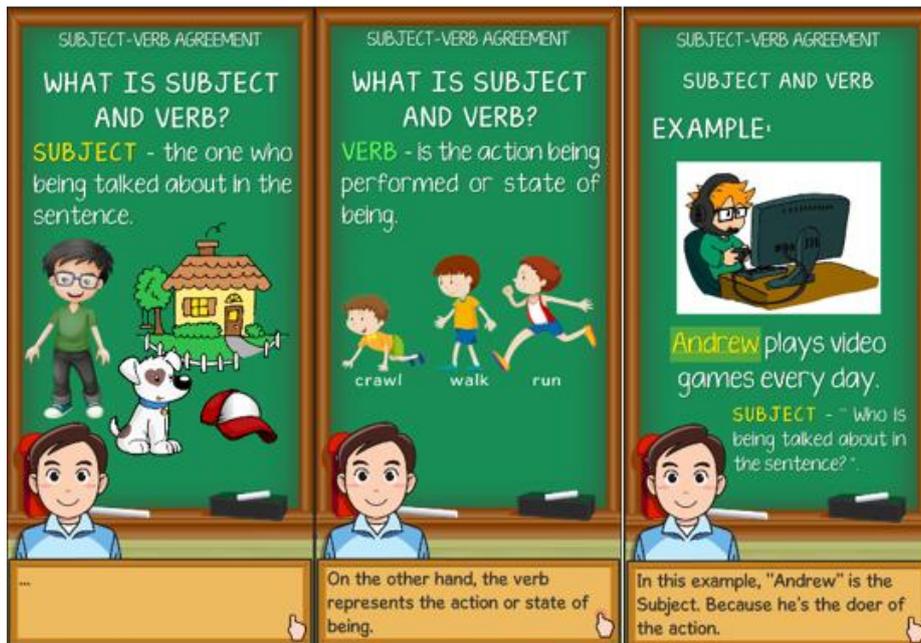


Fig. 6. Game lessons as narrated by *Alvin*



Fig. 7. Alvin's expressions accompanied with static expressions and corrective text feedbacks

Figure 8 shows how exercises in the Play mode are provided by the developed mobile learning application. The number of total exercises in each lesson are also shown in Figure 8 (e.g., 1/30, 3/100, 1/00). The exercises are provided in a randomized manner every time the user opens the Play mode. For the extra games, the user is provided with three heart points as seen in Figure 8. Each heart point is deducted when the user provided the wrong answer until it reaches zero to which the extra exercises will end.

Another salient feature that students found to be helpful in assisting their language learning through mobile application is its capability to interact with the user [27]. This is seen in the study of Poggiali [28] to which the findings showed that learners exhibited enthusiasm when animation is also applied as medium of instruction. Additionally, animated visual cues and customized media content as pedagogical tools can simulate student interest in the learning process [30]. For example, one study in the Philippines showed that a developed mobile game intended for basic English language learning can improve student performance particularly in vocabulary, spelling, and grammar [31].



Fig. 8. Game exercises

## 5 Conclusion and recommendations

The study was able to develop a mobile learning application intended for subject-verb agreement - the identified least mastered topic in English language. This was identified through the interviews among English teachers which were supported by multiple studies conducted in the Philippines. The study also identified smartphones as the device of choice by most of the respondents of the study as well as the Android OS as the right platform based on market share in the Philippines.

Due to the continued implementation of lockdowns and community quarantines in the Philippines, the application did not undergo any user acceptance testing (UAT). It is recommended that the application be subjected to UAT when lockdowns and quarantines are lifted or once face-to-face classes are already permitted. Testing its usability in particular or actual setting (e.g., in classroom setting, in blended class, in self-regulated learning) is also highly suggested.

Additional recommendations are based on the study of Bourekkache, Kazar [18], Kacatl, and Klímová [20] in which they suggested that future undertakings of mobile applications for English language learning should focus on one of the four basic language skills (i.e., listening, speaking, reading, and writing). Future researchers may explore the possibility of adding new least mastered topics as well as making the application and the animated character *Alvin* intelligent through the help of different artificial intelligence techniques (e.g., data analytics and machine learning). Future studies may also consider developing an application that is localized and culturally

aware – factors which were not considered during the conduct of the study as mentioned in the study of Bringula [45].

## 6 Acknowledgment

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## 8 Authors

**John Paul Palo Miranda**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

**Roque Francis Badajos Dianelo**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

**Alvin Miguel Yabut**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

**Charles Anthony Lacson Paguio**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

**Arjie Geronimo Dela Cruz**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

**Harvy William Gunayan Mangahas**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

**Kim Cardenas Malabasco**, is with Don Honorio Ventura State University, Bacolor, Pampanga, Philippines

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