

Development and Field Testing of a MALL for Filipino with a Reusable Framework for Mobile-Based Drills

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Abstract: This paper describes the development and field testing of *Ibigkas!* Filipino, a mobile game that exercises learners' fluency in identifying synonyms (*kasingkahulugan*) and antonyms (*kasalungat*) in the Filipino language. Twenty-four students from Grades 4, 5, and 6 were invited to play and answer comprehension tests to determine whether the game helped them improve their understanding of the content. Self-report questionnaires assessed the extent to which they enjoyed it. Additionally, three teachers were invited to a focus group discussion (FGD) to gather their insights about the game and how they may use it in their classes. Self-report feedback from students showed the game was fun, interesting, and sufficiently challenging. A significant increase in the post-test comprehension scores of the Grade 4 participants was found. This shows the potential of the game to make learning fun while helping realize learning goals. Teachers indicated they can use the game to supplement their Filipino classes and that the students will be receptive to the idea of utilizing a game for learning.

Keywords: game-based learning, Filipino comprehension, Philippines, mobile-assisted language learning

1. Context and Motivation

Filipino is the official and national language of the Philippines (The 1987 Constitution of the Republic of the Philippines, Article XIV). It is based on Tagalog, one of the country's major languages. The 1987 Philippine Constitution stipulates that the Philippine government is to "take steps to initiate and sustain the use of Filipino as a medium of official communication and as a language of instruction in the educational system" (The 1987 Constitution of the Republic of the Philippines, Article XIV). There are policies that have been established to fulfill this end (DO 81, S. 1987). At present, the Basic Education Program are guided by the Policy Guidelines on the K to 12 Basic Education Program (DO 21, S. 2019). This order states that the medium of teaching and learning from Grades 1-12 are both Filipino and English. Also, Filipino subjects are part of the core learning areas in all grade levels.

In spite of these efforts, Filipino learners still have difficulty in speaking, reading, and writing in Filipino. Many learners who are born and raised in the Philippines use English as their first language (Roque et al., 2017). Hence, many of these learners have difficulty speaking, reading, and writing in Filipino. When in school, they learn Filipino as a second language, often needing English translations of texts to increase comprehension (Roque et al., 2017). These deficiencies are also evident in the results of within-country tests. The Philippines' Department of Education (DepEd) Regional Office 02 (Cagayan Valley) reported that their 2018 NAT results for Grade 6 show that the mean performance by subject area were far below the 75% acceptable MPS with scores for Filipino averaging 51.68% (DepED RO2, 2019). Additionally, Proficiency Level Distribution in the subject shows that about 95% of the examinees did not reach the proficiency level for Filipino with only 0.02% and 5.65% being highly proficient and proficient, respectively (DepED RO2, 2019). Apart from the wide influence of Western culture, other factors may contribute to. In a PETS-QSDS (Public Expenditure Tracking Surveys-Quantitative Service Delivery Surveys) study conducted in 2014 involving a nationally

representative sample of 946 Grade 10 high school teachers, roughly 38% mentioned the need for better facilities and about 60% expressed the need for additional teaching materials (Al-Samarrai, 2016).

As a response to the need for additional learning materials, the Ateneo Laboratory for the Learning Sciences has developed mobile phone-based games that can be used to support the learning process in Philippine classrooms. In this paper, we describe the development and field testing of *Ibigkas! Filipino*, a mobile game that exercises learners' fluency in identifying synonyms (*kasingkahulugan*) and antonyms (*kasalungat*) in the Filipino language. The purpose is two-fold: (1) to describe *Ibigkas! Filipino* and how it was built using a framework for creating mobile collaborative, drill-and-practice type games; and (2) to assess the target audience's response to the game.

2. Mobile Learning

Mobile learning is becoming popular in educational environments because of its mobility and portability. Through the use of mobile devices, learning can take place anytime and anywhere, breaking past the temporal and spatial limitations of traditional learning methods (Christensen & Knezek, 2017).

Developing countries have recorded mobile phones to be their primary computing platform. As of 2018, the developing world had an estimated 102.8 mobile phones for every 100 people (ITU, 2018). Consequently, teachers and students continue to explore integrating this technology in the teaching and learning process. This is apparent in the Philippines. In a survey of 710 Grades 4, 5, and 6 students from two elementary state schools in Metro Manila, it was found that they have access to cellular phones (63%), computers (54%), and tablets (36%) (Rodrigo et al., 2019b). This shows the mobile platform is a promising venue for delivering learning support to a wider range of users. Hence, *Ibigkas! Filipino* was implemented for use on mobile devices such as cell phones and tablets.

3. Digital Game-Based Learning

Digital Game-Based Learning (DGBL) is a learning approach that incorporates educational content into digital games (Chang & Wang, 2019). It is a method that utilizes the entertainment capabilities of games in learning environments. The growing popularity of using games as tools in education may be attributed to the motivational affordances (e.g. immediate feedback, quests) inherent to them. They can create fun experiences that stimulate positive attitudes and emotions among learners while assisting in the realization of learning goals. DGBL is found to be common in teaching knowledge and skills in different topics such as science, mathematics, and language learning, among others.

3.1 Collaborative Learning Games

Collaborative learning (CL) is defined as “a fundamentally social process of knowledge-building”, in which learners are provided an environment where they can work together to complete a task while communicating with one another during the process (Kukulska-Hulme & Viberg, 2018). CL can take place between two learners, or even a learner and a teacher (Kukulska-Hulme & Viberg, 2018). CL necessitates learners to articulate their thoughts to contribute to the groups' mutual pursuit of a learning task (Koschmann et al., 1996). Collaborative games are activities in which players who share a common goal work together in order to share payoffs and outcomes (Zagal et al., 2006). The consequences of an individual decision, whether positive or negative, are shared by all the members of the group. Research has shown that collaborative games are fun, engaging, and motivating (Wendel et al., 2013), hence, able to promote positive learning attitudes, achievement, and self-efficacy.

3.2 Mobile-Assisted Language Learning (MALL)

The emergence of mobile learning has reached many different subjects, including that of language learning. Mobile-Assisted Language Learning (MALL) is an area within mobile learning that focuses on language learning topics such as grammar, listening and reading comprehension, and vocabulary acquisition (Sung et al., 2015). In a systematic review conducted by Pesson and Nouri (2018), it was found that most research in MALL focus on improving L2 (Second Language) proficiency. Additionally, their review showed how MALL was commonly used in formal education, typically

included as a support to existing curricula. This warrants other researchers' perspective that MALL applications can be used to support learning in both formal and informal contexts (Sung et al., 2015).

4. *Ibigkas!* Filipino

Ibigkas! Filipino is a game for practicing identification synonyms (*kasingkahulugan*) and antonyms (*kasalungat*) in the Filipino language. It was built using a framework for creating mobile collaborative, drill-and-practice type games for both Android and iOS devices. The framework is flexible enough to accommodate any subject area in which learners have to identify what items go together or map to each other. Other games that were developed to test the framework's flexibility are *Ibigkas!* – a game that helps learners develop fluency in identifying rhymes, synonyms, and antonyms in English (Rodrigo et al., 2019b) and *Ibigkas!* Math – a game for learning arithmetic (Rodrigo et al., 2019a).

Ibigkas! Filipino was created as a response to teachers' feedback from previous experiments to create a game for teaching the Filipino language. Like the other *Ibigkas!* games, it has two modes: single-player and multi-player. In the single-player mode, the game starts by asking the player to choose a content mode (*kasingkahulugan* or *kasalungat*) and a level of difficulty. When the game begins, the player receives a target word and a list of three word choices. The player must select the word that is the best match to the target word. The multiplayer mode allows groups of up to 8 to play together. Each player must have a mobile phone that is connected to a network (not necessarily the Internet). At the start, the host player selects the content mode (*kasingkahulugan* or *kasalungat*) that they will play. When a game round begins, a random player from the team receives the target word (Figure 1a). All players will then receive lists of words, only one of which is the correct answer that corresponds to the target word (Figure 1b). The player who has the target word has to say it aloud (*Ibigkas* is Filipino for 'speak up') so the other players can know what it is. All other players then check their list of words to see if they have the correct answer. The player with the correct answer should likewise say it aloud and tap it on his screen. Once the correct answer has been tapped, the round ends and a new one begins.



Figure 1. Sample synonym (*kasingkahulugan*) task.

5. Testing Methods

The field test for *Ibigkas!* Filipino was conducted at a public school in Metro Manila, Philippines. Students from Grades 4, 5, and 6 were invited and grouped by grade level during the study. Separate testing sessions for each grade level were ran due to the limited number of available mobile phones. The participants were given an orientation about the study and the details of their participation. Then, they answered a demographics questionnaire that determined their level of access to mobile phones. It also tried to assess their usage, attitude, and perception towards the Filipino language by giving them 8 statements to which they would specify their level of agreement (1 = Strongly Disagree to 5 = Strongly Agree). Some sample statements are "I speak Filipino at home." and "Learning Filipino is important." After completing the demographics questionnaire, students answered a 12-item multiple choice pre-test that tried to assess their ability to determine the correct synonym (*kasingkahulugan*) or antonym (*kasalungat*) of a given Filipino word. Once done, they were asked to play *Ibigkas!* Filipino for about 20 minutes. After which, a 12-item multiple post-test was given to evaluate whether they were able to improve their Filipino language comprehension skills through the game. The comprehension tests were based on the pool of questions in the game. Lastly, they were asked to complete a two-part questionnaire with items adapted from the GBL Engagement Metric (Chew, 2017) and the IMI questionnaire (Ryan, 1982).

6. Analysis

6.1 Participant Profile

A total of 24 students participated: 10 from Grade 4 and 7 each from Grades 5 and 6. Majority of the Grades 4 and 6 participants owned cell phones. However, only 2 of the 7 Grade 5 students had their own. All of them played cell phone games and most were into playing educational games. See Table 2.

Table 2

Profile of Participants

	Grade 4		Grade 5		Grade 6	
	M	F	M	F	M	F
N	5	5	3	4	3	4
Age Range	9 - 11		10 - 11		11 - 12	
Had their own cell phones	8 (80%)		2 (26%)		5 (71%)	
Played games on cell phones	10 (100%)		7 (100%)		7 (100%)	
Played educational games on cell phones	6 (60%)		7 (100%)		7 (100%)	

When asked about their usage, attitudes, and perception towards the Filipino language, students said they spoke Filipino at home (4.5/5.0) or with their friends (4.6/5.0). They did enjoy learning (4.6/5.0) and reading (4.6/5.0) in Filipino. They expressed a desire to learn Filipino (4.4/5.0) and agreed that it is important (4.6/5.0). These show that the students tend to use Filipino as a medium of communication and are inclined to improve their skills and knowledge of the language.

6.2 Game Engagement Results

Ibigkas! Filipino generally stimulated positive feelings in the students as per their self-report responses. Results of the GBL questionnaire show that they followed instructions carefully (4.5/5.0) and tried their best to identify the correct synonym (*kasingkahulugan*) or antonym (*kasalungat*) of the target word (4.7/5.0). The game allowed them to utilize their previous knowledge (4.8/5.0) and further improve their Filipino vocabulary (4.6/5.0). Playing the game interested them (4.6/5.0) and that they look forward to finishing each level (4.7/5.0). The Grade 4 students seemed to be more open to asking questions when they were lost (4.3/5.0) than the Grade 5 (3.57/5.0) and Grade 6 (3.71/5.0) students. Generally, they said the game is fairly challenging (3.7/5.0). The IMI results showed the students enjoyed the game a lot (6.96/7.0). Students said it was fun to play (6.96/7.0), with scarcely any who thought it was boring (1.9/7.0). It was important for them to do well in the game (6.6/7.0) and so they tried their best to answer correctly (6.8/7.0). They expressed uncertainty with regards to how skilled they were in the game (4.8/7.0). Nonetheless, they were satisfied with how they performed (6.8/7.0).

6.3 Comprehension Scores

Part of the study was to examine whether playing the game improved the students' performance. Grade 4 students' pre-test scores averaged 59%, Grade 5 students averaged 60%, and the Grade 6 students averaged 68%. While it was somehow expected that the higher grade levels have higher average scores, a single-factor ANOVA showed that the differences among the groups were not significant ($F(2,21)=0.56$, $p=0.58$). The post-test scores show an increase with the Grade 4 students averaging at 77%, Grade 5 at 71%, and Grade 6 students at 75%. Paired sample t-tests to compare the pre- and post-test scores per grade level were performed to determine if the differences were significant. Table 3 shows that the scores of the Grade 4 participants before ($M=7.1$, $SD=2.77$) and after ($M=9.2$, $SD=2.84$) playing *Ibigkas! Filipino* was significant ($t(18)=-2.8$, $p=0.006$). However, no significant differences were found between the pre- and post-test scores of the Grade 5 and Grade 6 participants.

Table 3

Paired Sample T-Test Results Per Grade Level

	Pre-Test			Post-Test		df	t	p
	N	mean	stdev	mean	stdev			
Grade 4	10	7.1	2.77	9.2	2.84	18	-2.8	0.006
Grade 5	7	7.14	4.48	8.57	1.62	10	-1.53	0.08
Grade 6	7	8.14	7.81	9	2	9	-0.72	0.24

These results suggest that the game may have helped improve the performance of the younger participants in the tests given. Given the small N, these findings have to be interpreted with some caution. They imply that the game has the potential to support learning of synonyms and antonyms in Filipino. However, more testing has to be performed for the results to be conclusive.

6.4 Focus Group Discussion (FGD) with Teachers

Three (3) teachers (one representative per grade level) were invited to participate in a focus group discussion (FGD) to determine the group activities they give their students that are focused on Filipino learning. The conversation likewise sought to collect their insights regarding *Ibigkas!* Filipino. Group activities usually come in the form of (1) role-plays; (2) composition (as in poems); poster-making; and (4) sentence construction based on pictures. The students' capabilities and the difficulty of the activities often determine how they are grouped. Teachers would sometimes give incentives to encourage participation. Students who do not contribute to group work are often given grade deductions, assigned reporting tasks, or asked to do a separate activity. The teachers generally liked *Ibigkas!* Filipino. They acknowledged how learners would enjoy playing it. They did not specify anything they dislike about the game, but they had suggestions such as setting a fixed time for every difficulty level and expanding the content (e.g. Filipino pronouns). They are interested in using it in their classes and they agreed it can be among the group activities they facilitate. They also think their students will enjoy the multi-player mode because it can be organized such that multiple groups compete to get the highest score. The added competitive element together with the collaborative nature of the game makes it more exciting.

7. Conclusion

This paper presents the implementation and testing of *Ibigkas!* Filipino, a collaborative, mobile phone-based, drill-and-practice game that helps learners develop fluency in identifying synonyms (*kasingkahulugan*) and antonyms (*kasalungat*) in the Filipino language. The students' self-report responses indicate positive feelings towards the game. They found it interesting and fun to play. They exerted effort in following instructions and identifying the correct match to the target words. It was important that they performed well, hence, they tried their best to answer correctly. The students expressed interest in improving their knowledge of the Filipino language. The comprehension scores turned out to be generally good. A significant improvement in the post-test scores of the Grade 4 students has been found. This indicates how the game may have helped improve the scores of the younger students. Their openness to ask questions whenever they felt lost might have contributed to this since they were somehow able to obtain feedback. Though not significant, an increase in the mean post-test scores of the Grades 5 and 6 participants was also noted. However, these results should be interpreted with caution due to a small N. Further testing is required to arrive at more conclusive results. Still, this study shows the potential of the game as an aid for learning Filipino synonyms and antonyms.

This work is an attempt to address the need for additional learning materials in the classroom. The feedback from the students demonstrate how the game can contribute to making the learning process more fun and interesting. The improvement in post-test scores, particularly for the Grade 4 students, is encouraging. Teachers' suggestion to expand the content is an indication that they see the value of these kinds of materials. As previously mentioned, the mobile platform is the most accessible to a wider range of audience, including those who may be underprivileged. The development of the *Ibigkas!* suite of games was driven by this so that more teachers and students will be encouraged to use them to make the realization of learning goals more fun and exciting.

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