

PRACTICE YOUR ENGLISH GRAMMAR (P.E.G): An Educational Mobile Application

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Abstract: The purpose of this research is to help people in easily learning English Grammar. Practice your English Grammar (PEG) helps the users to enhance their English Grammar. The project aims to help people who are having difficulties with their English subjects or having trouble understanding or learning English grammatically. The application has four (4) main modules (Learn, Test, Watch and Hear). There are definitions about 'Parts of Speech' which is in the Learn module; Grammar exercise is in the Test Module, Hear module and Watch Module. The project was developed using Unity 3D Game Engine as its frontend and the researchers used C# programming language as the backend. The project was designed using Adobe Photoshop CS6. The application can only be used in android phones and requires an android version of 4.1 Jellybean and up. The functionality test and conformance test was used by the researchers; tested by the technical adviser and end-users. Test results from the end-users; the number of criteria in Functionality testing is sixty-four (64); the number of pass in the criteria is sixty-four (64) and the fails are zero (0) with a percentage of 100%, in terms of Conformance testing by end-users; the number of criteria is twenty-three (23), the number of passes is nineteen (19) and the number of fails is four (4) with a percentage of 82.61%. The test results for the technical adviser; the number of criteria in Functionality testing is sixty-four (64); the number of pass in the criteria is sixty-four (64) and the fails are zero (0) with a percentage of 100%, in terms of Conformance testing by end-users; the number of criteria is twenty-three (23), the number of passes is nineteen (19) and the number of fails is four (4) with a percentage of 82.61%. The study was assessed using the following: Engagement, Functionality, Aesthetics, and Information. The researchers conducted an evaluation involving thirty-five (35) end-users and ten (10) IT experts. The instrument used to conduct the testing is Mobile Application Rating Scale (MARS). The overall total Standard deviation for IT experts and End-users is "0.04" "0.03" respectively, and a mean of "3.62", it is interpreted as "Highly Acceptable". The result of the evaluation shows that the project is a useful tool in learning English Grammar.

Keywords: Encryption, Compression, File Sharing, Security, English Grammar, Android.

I. INTRODUCTION

In linguistics, grammar is the set of structural rules governing the composition of clauses, phrases, and words in any given natural language. The term refers also to the study of such rules, and this field includes morphology, syntax, and phonology, often complemented by phonetics, semantics, and pragmatics[2],[12].

The term grammar is often used by non-linguists with a very broad meaning. As Jeremy Butterfield puts it, grammar is often a generic way of referring to any aspect of English that people object to [2],[12]. However, linguists use it in a much more specific sense. Speakers of a language have a set of internalized rules for using that language.

English is a West Germanic language that was first spoken in early Medieval England and is now a global "lingua franca". English is either the official language or an official language in almost 60 sovereign states. It is the most commonly spoken language in the United Kingdom, the United States, Canada, Australia, Ireland, and New Zealand, and

is widely spoken in some areas of the Caribbean, Africa, and South Asia. It is the third most common native language in the world, after Mandarin and Spanish. It is the most widely learned second language and an official language of the United Nations, of the European Union, and many other worlds and regional international organizations.[22]

The tools used in English reading grammars are textbooks. Textbooks are reliable to use but it is also a hassle to bring books when you are on a vacation or traveling [23]. It is the reason that the developers developed an Android application.

This project teaches the topics about the “Parts of the speech” in the application. Users can read definitions about these topics; in that case, this application can be used as a learning tool for people who want to learn English Grammar through mobile devices.

1.1 Objectives of the study

The project develops “Practice your English Grammar (PEG): An Educational Mobile Application” for Smartphone users. Specifically, the project intended to:

1. design and develop an Android application that has the following functions: (a) Learn Module: wherein the users can read about the different parts of the speech to help them and guide them about the exercises, (b) Read different parts of the speech using the learn module, (c) Test Module: There are choices such as primary, secondary and college-level; these choices are the level of difficulty with exercises, (d) Hear Module: The users can listen to a voice record and they can identify the verb, pronoun, adverb, adjective, conjunction,[5],[6],[7],[8],[10],[11],[15],[18],[19],[20].(e) Watch Module: The application has a watch module where users can identify a verb, (f) Scoreboard: The application has a scoreboard where users can view their scores and the scores of the other users, 2. create the project using Unity as frontend and using C# as the backend. It runs on the Android platform smartphone and tablet, 3. test and improves the application using functionality and conformance testing, 4. evaluate the acceptability of the application software based on Mobile Application Rating Scale (MARS),[17],[21],[25],[26] with the following criteria: (a.) Engagement, (b.) Functionality, (c.) Aesthetics, (d.) Information

1.2 Significance of the Study

In this section, the beneficiaries of the study are discussed below:

- Students. The importance of the study contributes to the benefit of the students because nowadays, a lot of students make use of technology (e.g. Smartphone) that English is indeed needed by students to talk to people in other countries correctly and properly of speaking, writing and/or listening. By using the application, the users can gain additional knowledge about English by giving exercises with different levels.
- Teachers. A teacher can also benefit from the project because they can use the application in giving their students exercises. It is beneficial for those teachers who are looking for easy access to the lessons about English or a specific topic.
- Mobile Users. Mobile users can be beneficiaries because most of the people nowadays are using their Android phones in their daily lives,[9],[13],[14],[16].
- Future Researchers. Another beneficiary would be future researchers who would be interested and can conduct a project related to this application.

1.3 Scope and delimitation of the project

The end-users of the application are generally public—smartphone users. Users can create an account. The application has 810 total questions in the grammar test. The application has 270 total of record voice in the hear module. The application has 60 totals of GIF in the watch module. It has a global scoreboard. The application has hints. It has coins; these coins can be used in buying hints. There are 8 topics (verbs, noun, pronoun, adjective, conjunction, preposition, adverb, interjection). The exercises are divided into 3 difficulties (primary, secondary, college). Users must have android 4.1 (Jelly Bean up to the latest version) to use the application.

Topics are limited to the Parts of the Speech only. The application can't connect to Facebook. No mini-games. It cannot be used in Android phones with Android version 4.0 (Ice cream) below, [1],[3],[4].

II. METHODOLOGY

The waterfall model is a sequential design process, used in software development processes, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of conception, initiation, analysis, design, construction, testing, production/implementation, and maintenance. The waterfall development model originates in the manufacturing and construction industries: highly structured physical environments in which after-the-fact changes are prohibitively costly, if not impossible. Since no formal software development methodologies existed at the time, this hardware-oriented model was simply adapted for software development, [24].

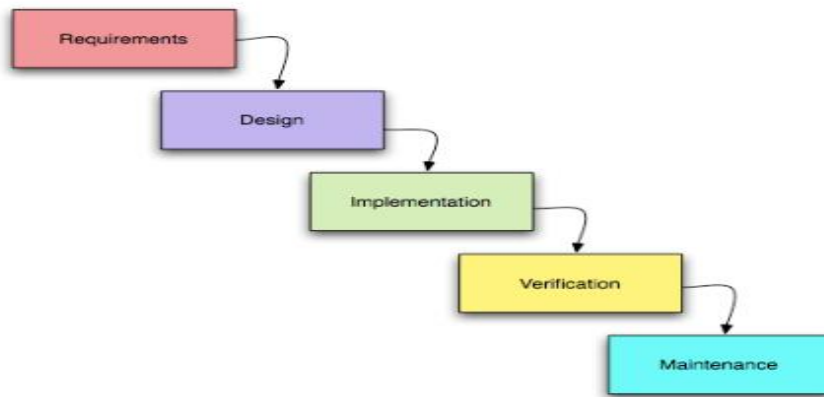


Fig.1: Sample Waterfall Model

The methodology used is the waterfall model. The team followed this methodology in developing the application. The researchers discussed the requirements in developing the project; after knowing requirements the team proceeded to design the application; after designing is the implementation; next is verification and maintenance.

DATA AND PROCESS MODELLING

In this section, all the data circulating within the application and how these are used are presented and discussed through the use of a various diagram.

PROGRAM FLOW CHART

A flowchart is a diagram that uses a set of standard symbols to represent the processes of a computer program/application.

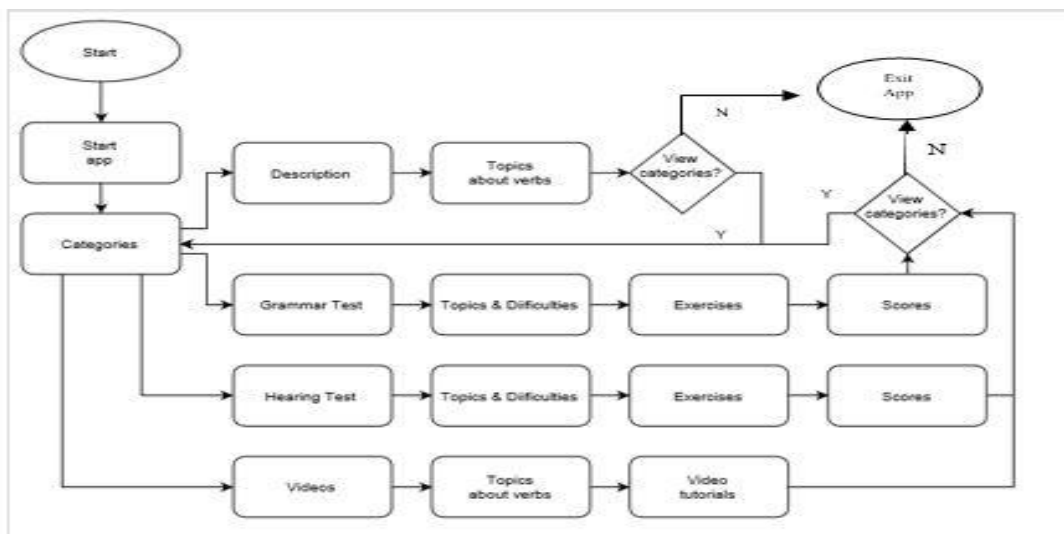


Fig. 2: Program flowchart of the project “Practice your English Grammar (PEG): An Educational Mobile Application

Figure 2 shows the actual flow on how the user interacts with the application.

OBJECT MODELLING

Object modelling is similar to data and process modelling. In object modelling, the entities involved with the application are highlighted as opposed to the data and process which are emphasized in the diagrams of data and process modelling.

ACTIVITY DIAGRAM

Activity Diagram is another important diagram in UML to describe dynamic aspects of the system. The activity diagram is a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. So the control flow is drawn from one operation to another.

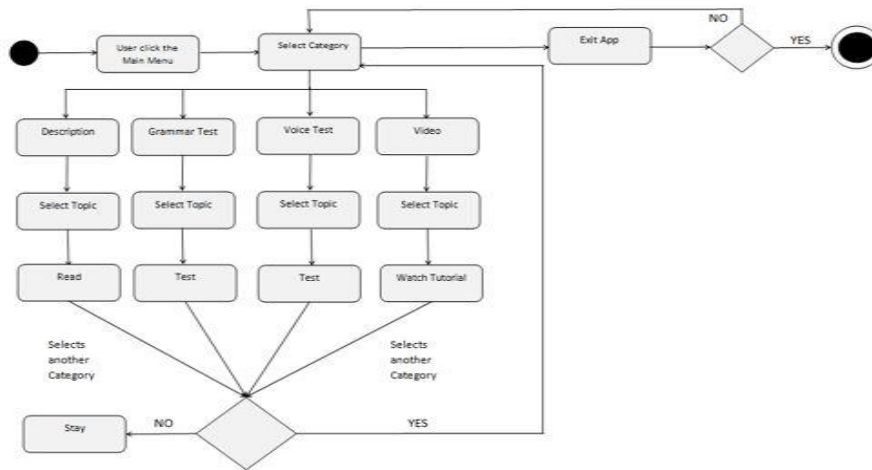


Fig. 3: Activity Diagram of Practice your English Grammar (P.E.G): An Educational Mobile Application

Figure 3 shows the Activity to another activity of the users on the application. It shows what activities of the users in using the application. The user can go to the main menu and can select a category, after selecting a category if the user selects another category it goes back to the category selection if the user didn't want to go another category the user stays. If the user did not pick a category, they can exit the application.

SEQUENCE DIAGRAM

A sequence diagram is an interaction diagram that shows how entities interact and operate with one another and in what order.

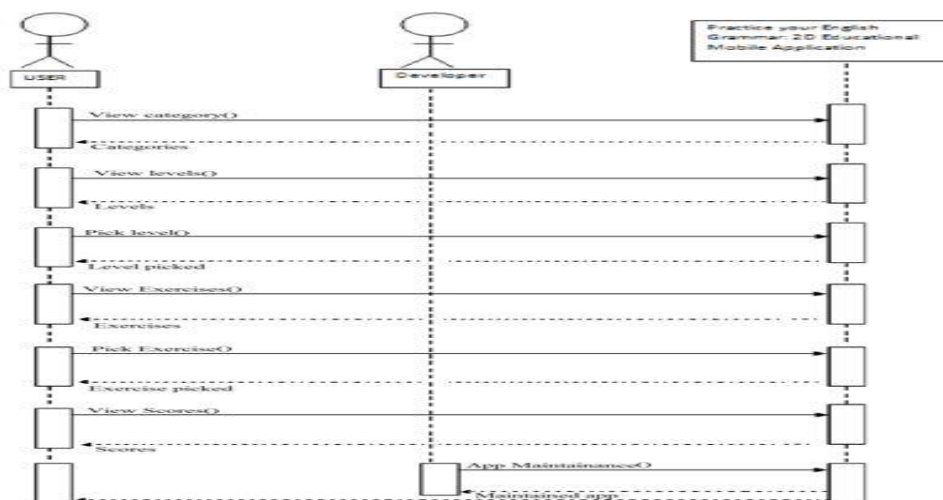


Fig. 4: The Sequence Diagram of Practice your English Grammar (PEG): An Educational Mobile Application

Figure 4 shows the sequence diagram of Practice your English Grammar: An Educational Mobile Application that illustrates how the entities interact with the application and what the application generates or outputs as per request from a particular entity.

III. RESULTS AND DISCUSSIONS

The Test and Evaluation Result is the procedure by which systems are matched against requirements and specifications through testing. The results are calculated to value the progress of design, performance, supportability, etc.

TEST RESULT

Functionality testing was conducted, followed by the conformance testing which tests every element of the application included the Standard Design, Navigation, Notification, Audio, Permission, Install Location, UI and Graphics, etc. The failed test cases in conformance testing were Policies and User Support. It was failed because the application is not yet uploaded in the Google Play Store at that time.

The team resolved this problem by uploading the application in the Google Play Store immediately.

TABLE I: TEST RESULT FROM END USER

Test Result for Functional and Conformance Testing by the Other Developers – Group				
Testing	PASS	FAIL	Total No. of Criteria	Percentage
Functional	64	0	64	100%
Conformance	19	4	23	82.61%

This table shows the test result from the evaluation conducted by the End User.

TABLE II: TEST RESULTS FROM TECHNICAL ADVISER

Test Result for Functional and Conformance Testing by the Other Developers – Adviser				
Testing	PASS	FAIL	Total No. of Criteria	Percentage
Functional	64	0	64	100%
Conformance	19	4	23	82.61%

Table 2 shows the test result from the evaluation conducted by the Technical Adviser.

EVALUATION RESULT

The result of the evaluation was based on the level of acceptability and proved that the application was ready for implementation.

TABLE III: 10 IT EXPERT EVALUATION RESULTS

Criteria	IT Expert		Interpretation	Rank
	Weighted Mean	SD		
Engagement	3.64	.04	Highly Acceptable	3
Functionality	3.60			4
Aesthetics	3.70			1
Information	3.68			2
GRAND MEAN	3.66			Highly Acceptable

Table 3 shows the overall Evaluation Results. Which states that the application is Highly Acceptable in all the criteria.

TABLE IV: END-USER EVALUATION RESULTS

Criteria	IT Expert		Interpretation	Rank
	Weighted Mean	SD		
Engagement	3.58	.03	Highly Acceptable	2
Functionality	3.61			1
Aesthetics	3.56			3
Information	3.55			4
GRAND MEAN	3.58			Highly Acceptable

Table 4 shows the overall Evaluation Results. Which states that the application is Highly Acceptable in all the criteria.

TABLE V: OVERALL EVALUATION RESULT

Criteria	Overall Evaluation		Interpretation	Rank
	Weighted Mean	SD		
Engagement	3.61	.01	Highly Acceptable	3
Functionality	3.61		Highly Acceptable	3
Aesthetics	3.63		Highly Acceptable	1
Information	3.62		Highly Acceptable	2
GRAND MEAN	3.62		Highly Acceptable	

Table 5 shows the overall Evaluation Results. Which states that the application is Highly Acceptable in all the criteria.

IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Discussed here is the important and crucial part of thesis writing. In this chapter, the findings are included, and the whole thesis is being summarized. Included here are conclusions, and recommendations for solving the problems discovered in the study.

4.1 SUMMARY OF FINDINGS

The purpose of the project is to help people to study English. The developers came to an android application and decided to use Unity 3D as a game engine and editor because it is easier to use and it is easier to design the application, C# as the programming language because it is easier to understand. The developers used photoshop in editing the Use-Interface of the application because of the easy way of editing pictures.

The purpose of the application is to give the users exercises for practicing their English grammar. The application has definitions, quizzes, and exercises; in this, the users can enhance English Skills. The users can compare their scores to other users. The developers included pictures where the users can identify what verb that the picture is stating. Listening is also included in the application where users are going to listen to a sentence and then identify the answer depending on the chosen topic.

Two test cases used functionally successful with 69 items are working and functioning accordingly.

The only failed item during the test conducted is in the Conformance because the application by that time is not yet uploaded in Google Play Store. The solution made is that the application is uploaded to the Google Play Store.

Overall the highest ranking is the Aesthetics with a “3.63” weighted mean and “0.54” Standard Deviation with an interpretation of “Highly Acceptable”, because of the layout, graphics, and visual appeal of the application. The lowest ranking in the evaluation is Functionality with a “3.61” weighted mean and “0.55” Standard Deviation and an interpretation of “Highly Acceptable”, the evaluators of the application are not satisfied with the functions of the application, they are still looking for more functions in the application.

4.2 CONCLUSION

The study developed an application with the title “Practice your English Grammar (P.E.G): An Educational Mobile Application” to help people in understanding and learning English grammar using their Android phones.

The application was designed with the following features: In the main menu, the user can toggle the background music and sound effects to turn it on and off. The user can see the scores of the other user in the Global scoreboard but cannot share the score on Facebook. The user can gain points in the Grammar test by answering questions correctly; these points can be used in buying hints. Hints can be used if the user is having a hard time answering the exercises in the Hearing test and Watch test. The application has references that users can visit. The user cannot exit an exercise in the grammar test without finishing and answering all the ten (10) questions. In the hearing test, users can use three (3) hints per question, the same thing in the watch test. Users can skip a question in Hearing and Watch test. In grammar test there is time pressure; the time limit is depending on the difficulty that the user chose. The project was designed using Unity 3D as the Game Engine and frontend and using C# programming language as the backend.

The application was tested and improved based on Functionality and Conformance test. The application was evaluated through the Mobile Application Rating Scale with the following criteria: Engagement, Functionality, Aesthetics, and Information. The evaluation respondents are composed of ten (10) IT experts and thirty-five (35) end-users. The overall

evaluation results are "Highly Acceptable" with "3.62" Mean and "0.56" Standard Deviation. The result of the evaluation shows that the project is a useful tool in learning English Grammar.

4.3 RECOMMENDATION

Based on the findings, test results, and conclusions, the following are the recommendations for future enhancement of the study:

1. Add mini-games such as completing a table and completing the sentences.
2. Add and improve functions in the application like connections in social media such as Facebook for leader board in the application.

IMPLEMENTATION PLAN

After testing and evaluation, the system is ready to be implemented and ready to be used. This chapter provides a detailed discussion of the application's implementation.

PROJECT IMPLEMENTATION CHECKLIST

Before implementing the application in its environment, the researchers considered several things first. The stages are the following: Stage 1, Check the application, the first step is to analyze the results of the testing and evaluation. The second step is to complete all the remaining partially implemented modules. Lastly is to fix the remaining bugs and errors in the application if there is still existing. Stage 2, Preparation for Implementation; the team must have an account in Google Play where they upload the app. After uploading the application in the Google Play, the team must finish all the documents and manuals; the team should give all the required documents and manuals for the application. Stage 3 is the implementation. The team should upload the application in Google play. The final stage is Maintenance; the developers should maintain the application; they should update and debug the application problems that are reported in the user feedback and reviews.

IMPLEMENTATION CONTINGENCY

After uploading the application to the Google Play, the users identify and report the bugs and errors that may appear when they use the application. One bug is in the scoreboard, the user may encounter problems in viewing the score of the other users. A user won't be able to compare their score to others if they don't have a stable connection. Incompatibility issues, lower versions of Android won't work properly; users may encounter downloading issues about the version compatibility of the application. Future bugs reported are addressed through maintenance and the developers will fix the bugs as soon as possible.

INFRASTRUCTURE DEPLOYMENT

After the implementation is complete, P.E.G is now implemented to its target users.



Fig. 5: Infrastructure Deployment of Practice your English Grammar (P.E.G): An educational mobile application.

The developers uploaded the application with app updates, and bug fixes on Google play. The end-users will download the application and use the application from their mobile devices. After using the application, the users can send their feedback, reviews and bug reports to the Practice your English Grammar (P.E.G): An Educational Mobile Application in Google play,[27],[28].

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