



LEARN EZ GAME APPLICATION

TEST PLAN

Version 1.0

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Submitted to—
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VERSION HISTORY

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	Wei Hua, Benedict, Marcus	6/9/2019	Benedict	9/9/2019	<i>Initial Version</i>

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1. Test Plan Identifier

Test Plan v 1.0

2. Introduction

The purpose of the test plan is to outline the different stages of the test that will be conducted on LearnEZ before it is released officially for the public usage. There will be 3 stages for the test – (1). White Box Test Stage, (2). Black Box Test stage and (3). Final Test Stage.

For the White Box Test stage, we will be following the test cases that our testing team has created as closely as possible and ensure to note and fix all the problems detected at that stage before moving on to the second stage.

As for the Black Box Test stage, we will gather 30 people, who do not have any prior knowledge about this apps to test it out and obtain the feedback on the product quality, user – friendliness and bugs detected during the test.

Last but not least, the Final test stage is basically a combination of both white and black box test performed to ensure that all issues detected in previous tests were properly addressed and solved in order to release a high quality product to the public.

3. Test Items

The testing activity scope will include:

1. Software Requirement Specification
2. System Quality Plan
3. Software Design Specification
4. LearnEZ System - Student & Teacher Account Features

4. Features To Be Tested

4.1 Student Account

Feature	Level of Risk	Reason
Login	High	If student cannot login to the system, student won't be able to access LearnEZ features.
Forget password	Medium	There is a possibility of student forgetting the password.
Change password	Medium	There is a possibility of student wanting to change their password.
Change	Low	There is a possibility of student wanting to change

Avatar		their avatar.
Logout	High	If the student is unable to logout from the system, they will not be able to exit the system fully.
View Class Leaderboard	High	This is the main feature of LearnEZ
View Global Leaderboard	High	This is the main feature of LearnEZ
View Discussion Board	High	This is the main feature of LearnEZ
Post Discussion	High	This is the main feature of LearnEZ
View Detailed Discussion	High	This is the main feature of LearnEZ
Post Comment	High	This is the main feature of LearnEZ
Gameplay	High	This is the main feature of LearnEZ
Use Powerup	Medium	Powerups are used by the students to answer questions when they are stuck while playing.
Buy Powerup	Medium	Powerups can be bought by the students to answer questions when they are stuck while playing
View Assignment	High	This is the main feature of LearnEZ
Create User Created Level	High	This is the main feature of LearnEZ
Play User Created Level	High	This is the main feature of LearnEZ

4.2 Teacher Account

Feature	Level of Risk	Reason
Login	High	If there is no account for teacher, teacher cannot login to the system
Check Class Performance	High	This is the main feature of LearnEZ
Check	High	This is the main feature of LearnEZ

Student Performance		
Post Assignment	High	This is the main feature of LearnEZ
Logout	High	If the teacher is unable to logout from the system, they will not be able to exit the system fully.

Features from user's viewpoint, with level of risk (high, mid, low) and reason

5. Features Not To Be Tested

It is decided that all cases in individual test cases will be tested.

6. Approach

The primary model used in this project is Agile model and hence the characteristics of the model will be adhered by the test plan.

6.1 Measures and Metrics

The following results will be collected by the development team:

- 1) Duration of debugging
- 2) Problem origins and areas
- 3) The number of testing required to be done

6.2 Levels of Testing

Eight's LearnEZ has four levels of testing: Unit, Integration, Acceptance and Regression testing respectively.

6.2.1 Unit Testing

Unit testing is a crucial component in testing as it ensures all the units are functioning as per what the requirements defined separately, thus enhancing the individual units' reusability. The development team is to create this segment for testing. The QA team is to test with the test cases provided in the test coverage. If any other inputs or outputs required by the test elements for other elements, written drivers and stubs will be provided.

6.2.2 Integration Testing

The next step of testing will be integration testing upon the completion of unit testing. Several units are integrated and combined together and tested as a group of units. Thereafter, with the different groups of units combined to integrate fully to become the full application. For integration testing, it will be done by the development and QA team.

6.2.3 Acceptance Testing

Next phase of testing will be acceptance testing which is to check with the client's requirements are fulfilled by the application. The test cases are to be prepared by the development and QA team who will be responsible for the testing. The whole application will be tested to check if it fulfils the client's requirements.

A beta version will be released to the clients if the application is deemed to be ready to be released to the client. Necessary improvements to the application will be made based on the feedback received from the client.

6.2.4 Regression Testing

The last phase of testing will be regression testing. Regression testing is used to check if the application that was developed and tested previously is able to perform correctly as it should be previously after changes were made. As code changes are inevitable, it might affect how the application perform with the code changes. With this testing, it can be brought to awareness of system bugs that arise through code changes and removing them from the application before any potential problem occurs to affect the whole application. Various changes will be reviewed to check which are the ones that could affect the application potentially in a great way. To solve these issues, preparation of regression tests will be needed for the application.

7. Item Pass/Fail Criteria

This could be an individual test case level criterion or a unit level plan or it can be general functional requirements for higher level plans.

At the Unit test level this could be items such as:

- a. All test cases completed.

- b. A specified percentage of cases completed with a percentage containing some number of minor defects.
- c. Code coverage tool indicates all code covered.

At the Master test plan level this could be items such as:

- d. All lower level plans completed.
- e. A specified number of plans completed without errors and a percentage with minor defects.

Feature tested	Pass Criteria	Fail Criteria
Student login	Student successfully login to LearnEZ	Student can't login to LearnEZ
Forget password	Email sent to patient for instruction to set new password	No email sent to patient
Change password	Student successfully change their password	Student can't change their password
Change Avatar	Student successfully change their avatar	Student can't change their avatar
Student Logout	Student successfully logout of LearnEZ	Student can't logout of LearnEZ
View Class Leaderboard	Student successfully view class leaderboard	Class leaderboard is not displayed
View Global Leaderboard	Student successfully view global leaderboard	Global leaderboard is not displayed
View Discussion Board	Student successfully view discussion board	Discussion board is not displayed / No discussion is available
Post Discussion	Student successfully post a new discussion thread	Student is unable to post a new discussion thread
View Detailed Discussion	Student successfully view discussion thread	Discussion thread is not displayed
Post Comment	Student successfully post a new comment on discussion thread	Student is unable to post a new comment
Gameplay	Student successfully play the game on LearnEZ	Gameplay is not loaded
Use Powerup	Student successfully use a powerup	Student is unable to use a powerup due to insufficient powerups

Buy Powerup	Student successfully buy a powerup	Student is unable to buy power due to insufficient currency
View Assignment	Student successfully view an assignment	No assignment is assigned
Create User Created Level	Student successfully create a user created level	Student is unable to create a user created level
Play User Created Level	Student successfully play a user created level	No user created level is created
Teacher Login	Teacher successfully login to LearnEZ	Teacher can't login to LearnEZ
Check Class Performance	Teacher successfully check class performance for his/her class	Class performance was not displayed
Check Student Performance	Teacher successfully check student performance for a student in his/her class	Student performance was not displayed
Post Assignment	Teacher successfully post an assignment on LearnEZ	Teacher is unable to post an assignment on LearnEZ
Teacher Logout	Teacher successfully logout of LearnEZ	Teacher can't logout of LearnEZ

8. Suspension Criteria And Resumption Requirements

8.1 Unit Testing

As unit testing is used to test each functionality in the application, the testing on a particular build will be stopped if the build fails the test. Testing will be resumed after the changes are made and reviewed accordingly.

8.2 Integration Testing

Integration testing is used to test if different builds of functionality can work together as one system. As long as any part of the testing is found to have failed, testing on the particular build will be stopped until it is reviewed and resolved. All of the builds must independently pass the unit testing before any integration testing can be carried out.

8.3 Acceptance Testing

Acceptance testing can only be carried out once the application passed the unit and integration testing. This will be a confirmation that the application is ready for review by the

client. The development team will need to prepare different sets of test cases to test the specification of the application. Failures of test cases will be recorded down and reviewed thereafter. Test cases that are in relation to the failed test cases will be kept on hold while the other independent test cases will be continued for testing. Acceptance testing can be conducted again only if the problems are resolved and the problems pass both the unit and integration testing phase.

8.4 Regression Testing

For the ensurity of major changes not affecting the overall application, the application have to pass the regression testing. This helps to keep a track record of changes and how these changes affect the application.

8.5 System Design Changes

If there are any problems arise for the design implementation of the application, test phases will be put on hold and priority will be given to the changes of the design of the application. A review and update have to take place to ensure that it will be able to synchronize the application only if the client is satisfied with the new design and a confirmation of the application architecture. Testing of the application will be resumed, if and only if, the design implementation is confirmed and the synchronization of the system is achieved.

9. Test Deliverables

The deliverables under test plans are as follows:

- 1) Test plan document.
- 2) Test cases.
- 3) Test design specifications.
- 4) Tools and their outputs.
- 5) Simulators.
- 6) Static and dynamic generators.
- 7) Error logs and execution logs.
- 8) Problem reports and corrective actions.

10. Remaining Testing Tasks

There are no remaining testing tasks required to be tested for the application.

11. Environmental Needs

11.1 White Box Test Stage

For the White Box Test Stage, it will be conducted by the development team. As such, the development team will use the 6 personal computers allocated to them to conduct the White Box Testing.

11.2 Black Box Test Stage

For the Black Box Test Stage, a group of 30 participants, without any prior experience with the application, will evaluate it based on product quality, user friendliness and bugs that occur while testing the application. 6 participants will use the personal computers allocated to the development team at a time, reducing the need for additional computers and allowing for more personalized feedback.

11.3 Final Test Stage

For the Final Test Stage, it will also be conducted by the development team. Based on the feedback from the 30 participants in the Black Box Test stage, the development team will perform the changes and testing required, contacting the participants if needed.

12. Responsibilities

Project Manager	<ul style="list-style-type: none">• Review and approve Test Plan, Schedule and approaches• Review and validate test results• Ensure deadline is met for each task assigned• Ensure project development is on track and arrange for discussion• Review with our client regularly• Identify and prioritize risks• Ensure resources and budget for testing are catered for
Quality Assurance Team	<ul style="list-style-type: none">• Identifies and defines the specific tests to be conducted.• Defines the technical approach to the implementation of the test effort• Implements and executes the tests• Log down the test results
Development Team	<ul style="list-style-type: none">• Identify features to test and create test cases• Review with our client product requirements regularly• Update progress of application development and existing problems• Review and validate test results• Review test approaches• Review test progress with Quality Assurance team

13. Staffing And Training Needs

The development team is required to be very familiar with the application, even with the features that they have not personally developed. This is to ensure that the development team can review and validate the application fairly.

During the Black Box Test Stage, the development team is required to respond to any queries that the participants might have. 15 separate patient and doctor accounts will be prepared before the testing.

The group of 30 participants will be split into 5 groups of 6. In those smaller groups, 3 participants will take the role of a doctor (with a provided doctor account) and 3 participants will take the role of a patient, then they will switch roles to experience both sides of the application.

In case the participants fail to sign up (due to a system bug), the patient accounts will be provided to them.

14. Schedule

The test plan will be executed in the 10th - 11th week of the project, as stated in the project proposal. It will be executed in between the 28th and 31th of October, to ensure that the changes can be made before the deadline. Participants for the Black Box Test Stage will be required to sign up before, and will be notified by email one week in advance before the testing occurs.

In case of a slippage in schedule, the development of the product will take priority over the testing, and the scope of the test plan may be reduced, such as reducing the number of participants in Black Box Test Stage.

15. Risks And Contingencies

At least two members of the development team must be present to provide assistance to the participants during the Black Box Test Stage. In the unlikely event that 4 members of the development team are unable to be present, the testing will be delayed by 1 calendar day.

The development team is expected to familiarize themselves with the application before 2nd of April, when the test plan is scheduled to begin. In the event that any member is not familiarized with the application during the Black Box Test Stage, they are expected to check with the other members of the development team. The Quality Assurance Team is expected to be familiarized with the application.

If the requirements of the project change before 28th of October, the priority for changes will go to major crash bugs found in the application. The number of participants will be reduced for the Black Box Test Stage, and the development team may have to work overtime to complete the test plan by the project deadline.

16. Approvals

Names	Roles	Signature
Marcus Tang	Project Manager	
Nicole Sim	Quality Assurance Manager	
Ong Wei Hua	Release Manager	
Tan Wei Xuan	Lead Developer	
Chong Yew Heng	Frontend Developer	
Benedict Low Yu	Backend Developer	