

HCI PROJECT 4, USER TESTING

GROUP 9, APOCALYPSE DEFENSE

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TEST PLAN

PURPOSE

The purpose of our user testing is to determine whether the game is fun, intuitive, and appropriately difficult.

PROBLEM STATEMENT

- What instructions are necessary for the game to be played?
- Will new users be able to understand objective of game?
- Will users understand how to place towers?
- Will user think game is too long/too short?
 - How long does it take to complete a game?
- Is the game difficult?
- Is the game fun?

USER PROFILES

All users were between the ages of 18 and 35.

User ID	Own android device?	Prior experience with android system?	Prior experience with Tower Defense games?
1	Yes, in the past.	Yes	Yes
2	No	Yes	Yes
3	No	No	A little
4	No	A little	Yeah, a lot online
5	No	No	No
6	No	Yes	Yes

METHOD

We performed a within-subjects test with no counterbalancing. The scenarios were structured so that learning would not affect the measurements taken. For each user, the following actions were taken, in order:

1. Introductions to the team
2. Reading of test script
3. Seating user in front of tablet
4. Mounting camera on user's head
5. Starting camera recording
6. Giving user a printout of scenarios/tasks
7. Instructing user to complete the scenarios in order by performing each task
8. Reminding user to speak aloud but that we could not respond
9. Pointing out icon for application
10. Asking user to begin
11. Taking notes while user proceeded through all scenarios
12. When finished, thanking user and asking to fill out questionnaire
13. Interviewing user
14. Thanking and dismissing user
15. Debrief amongst team members
16. Set up for next test

TEST ENVIRONMENT & EQUIPMENT

Tests were held in the UM graduate student village community center in a private room. Video (with audio) recordings were made using a GoPro Hero2 camera mounted on the user's head. The user was seated in front of a tablet computer containing the game application. Team members were sitting or standing near the user, taking written notes.

ROLES

Throughout the tests, team member roles changed. However, Blair consistently read the test script and Pat was always in charge of video recording. Each member acted as test administrator at least once, and all members performed data logging. No precise timing was done, so no member was responsible for this area; instead, each member put estimates on her/his data sheet.

EVALUATION MEASUREMENTS

QUANTITATIVE

Approximate time from starting task 2b to starting task 2d

What button does the user press to exit the application?

Approximate total time spent on playing in task 3d

Does the user see the connection between placing towers, their cost, and cash available?

Can the user find the pause/unpause button?

QUALITATIVE

What confused the user?

Does the user appear frustrated?

Does the user appear to be having fun?

Does the user understand the objective of the game?

What comments/questions does the user make/have?

TESTING MATERIALS

TEST SCRIPT

Hi and welcome to our user testing for Apocalypse Defense, a game for android devices created this semester in our computer science class. We'd like to take this opportunity to thank you for volunteering your time to help us test this new game. I will be reading from this script to ensure consistency between all of our participants.

Now a little about Apocalypse Defense. It is a game where zombies are attacking the last human survivors. It follows the tower defense genre with a few modifications. Please note that the game is still in development stage and it may break down during the test. If that does happen, let us know and we will restart the program.

Understand that this exercise is to test the product and its usability and in no way implies anything about your abilities. If at any time you feel uncomfortable, please inform us and we will terminate the exercise immediately.

We will be recording this exercise so that we can gather as much information as possible from this session. The videos will not be shared with anyone outside of our class, and all copies will be destroyed at the end of this semester. The same goes for any documents you fill out.

Your opinion and ideas are important to us. Whenever possible, please speak your thoughts freely. Do not be concerned about offending us. If you forget to think aloud, I'll remind you to keep talking.

As you're working through Apocalypse Defense, I won't be able to provide help or answer questions. This is because we want to create the most realistic situation possible. Even though I won't be able to answer your questions during the exercise, please ask them. We'll note your questions and answer them at the end of the exercise.

Do you have any questions?

CHECKLIST

PRE-STUDY

Ensure enough fresh printouts

Four copies of scenarios/tasks

Three copies of blank data collection sheet

One copy of test script

Ensure enough memory/battery in camera

STUDY

Review instructions together (test script)

Review procedures if they get stuck

Any questions before we begin?

Start camera

Do tasks

Stop camera

POST-STUDY

Ask users not to discuss experiment with others

DEBRIEF USER

Post-test questionnaire

Interview

END

Dismiss user and thank them

Debriefing and note session

DATA CAPTURE FORM

		Participant #:	Date:	Time:
Scenario/Task #:	Task Description:	Comments:		
1a	Open Application			
1b	Start a new game with any difficulty			
1c	Play for thirty seconds			
1d	Exit the application			
2a	Open Application			
2b	Start a new game with any difficulty			
2c	Play until you have killed 10 or more zombies			
2d	Pause the game			
2e	Wait for 5 seconds			
2f	Unpause the game			
2g	Play until you have at least \$300			
2h	Return to the main menu			
3a	Open Application			
3b	Start a new game with any difficulty			
3c	Play until you win the game, lose the game, or want to quit			
3d	Exit the application			
	Post-Test Interview Questions	Comments		
	Anything else you want to say?			
	Did you have any problems? (or bring up noted issues)			
	(Ask about user's answers to questionnaire)			

SCENARIOS/TASKS

1. You are waiting for the bus and you want to play a game.
 - a. Open the application
 - b. Start a new game with any map and any difficulty
 - c. Play for thirty seconds
 - d. Exit the application

2. You are playing the game, but are interrupted temporarily, then you want to see the artwork on the main screen again.
 - a. Open the application
 - b. Start a new game with any map and any difficulty
 - c. Play until you have killed 10 or more zombies
 - i. If you lose the game, go to the main menu and start from step b.
 - d. Pause the game
 - e. Wait for 5 seconds
 - f. Unpause the game
 - g. Play until you have at least \$300
 - i. If you lose the game, go to the main menu and start a new game, then play until you have at least \$300.
 - h. Return to the main menu

3. You have a lot of free time and want to beat the game.
 - a. Open the application
 - b. Start a new game with any map and any difficulty
 - c. Play until you win the game, lose the game, or want to quit
 - d. Exit the application

POST-TEST QUESTIONNAIRE

User ID:

Please rate the following (scale of 1-5 where 1 is the lowest and 5 is the highest):

1. Rate your overall experience ____
2. Rate the ease of learning to navigate the interface ____
3. Rate the ease of learning to play the game ____
4. Rate the ease of winning the game (1 is too easy, 5 is too hard) ____
5. Rate the enjoyability of the game ____

PLEASE ANSWER THE FOLLOWING:

1. What did you like about the game interface?
2. What did you dislike about the game interface?
3. Was the game fun?
4. Was the game difficult?
5. Would you want sound effects and/or music?
6. What would make the game better?
7. What was most frustrating about the game?
8. Does the game need instructions? If so, what should they say?

POST-TEST INTERVIEW

1. Do you own an android device?
2. Do you have any prior experience with android devices?
3. Have you played tower defense games before?
4. Anything else you want to say that you didn't get to mention in the questionnaire?
5. Did you have any problems? (or bring up noted issues)
6. (Ask about user's answers to questionnaire.)

CONDUCT TEST

During the test, we adhered to the listed requirements for the project 4 specifications document. The test was very successful, resulting in great feedback from users with a variety of backgrounds. We followed the test plan, utilizing the test materials with 6 users where users 1 and 2 were tested as a pair. The rest of the users were tested individually. We realized after printing off the sheets that we needed to ask about their Android, smartphone, and gaming experience, so we asked that at the end of the interview.

ANALYSIS

Looking back at our problem statement, we can confidently provide the following answers:

- What instructions are necessary for the game to be played?
 - How to place a tower
 - How to know when you can place a tower (i.e. connection between cash and cost of tower)
 - How to use standard android buttons to navigate and exit.
- Will new users be able to understand objective of game?
 - Not in all cases. One user tried to tap on each zombie rather than place towers in a strategic pattern.
- Will users understand how to place towers?
 - No. Instructions are necessary.
- Will user think game is too long/too short?
 - How long does it take to complete a game?
 - About ten minutes (user 4)
- Is the game difficult?
 - No (users 6, 4, 3, 2, 1), yes (user 5)
- Is the game fun?
 - “Yes, but repetitive” user 6
 - “Somewhat” user 5
 - “Yeah, I enjoyed the spontaneous pop of zombies. It added a little difficulty because you couldn’t see them coming and didn’t have time to bolster your defense.” user 4
 - “No” user 3
 - “Kinda at first it was but then it got really boring” user 2
 - “I enjoyed playing it, got a kick out of the zombies” user 1

Problem	Potential solution
Choosing a new map	Remove label that says to swipe for new map, until new maps are created (or label that says “coming soon”)
Understanding how to place first tower	Tutorial screen before gameplay begins will explain how to place first tower.
Connection between cost of tower and placing new towers	Make label font larger for cost of tower, as well as possibly doing an animation for purchasing the tower. Also, some feedback for if tower is unpurchasable.
Noticing available gold label	Make label font larger (animation when money spent or earned)
Noticing zombie killed label	Make label font larger (animation when zombie killed)
Not able to tell if zombie is dying or how much health is left on survivor	Draw health bars on survivors and zombies to show how much damage has been taken, and how much health is left.
Cannot figure out how to play initially	Tutorial screen before gameplay begins will explain the purpose and controls for game.
Many people paused on “Overwrite existing game” confirmation screen when trying to play a new game.	This might be okay, since we want the user to be aware of the decision they’re making before making it.
No clear point to playing game, no replayability	Adding more features should fix this issue. More maps, more guns, upgrades, new survivor types, etc. (version 2)
Game is too easy	Adding features and incrementing tower costs and zombie difficulty should fix this.
Android default hardware buttons are not obvious to	The tutorial will explain the button functionality, as well as possibly

non-Android user.	include on-screen alternatives for redundancy.
No achievements	Adding achievements feature will fix this.
Pause button should bring up menu	Adding the options menu as a redundant feature on the pause button will fix this.
Need feedback for killing zombies and taking damage	Need to add animation for sprites (attacking, shooting, pointing toward the zombie or survivor)
Hard to tell how to place towers (do I drag or press the screen?)	Add tower drag feature from gutter to the map
Need more active participation, more goal-oriented (intuitive path for zombies or something for survivors to protect, etc.)	Add these features into game, create more goals and achievements to match.
Survivors towers should not be able to stack	Create better bounding box for towers and zombies

At this stage, none of the potential solutions have been implemented.