

# EthioQuiz

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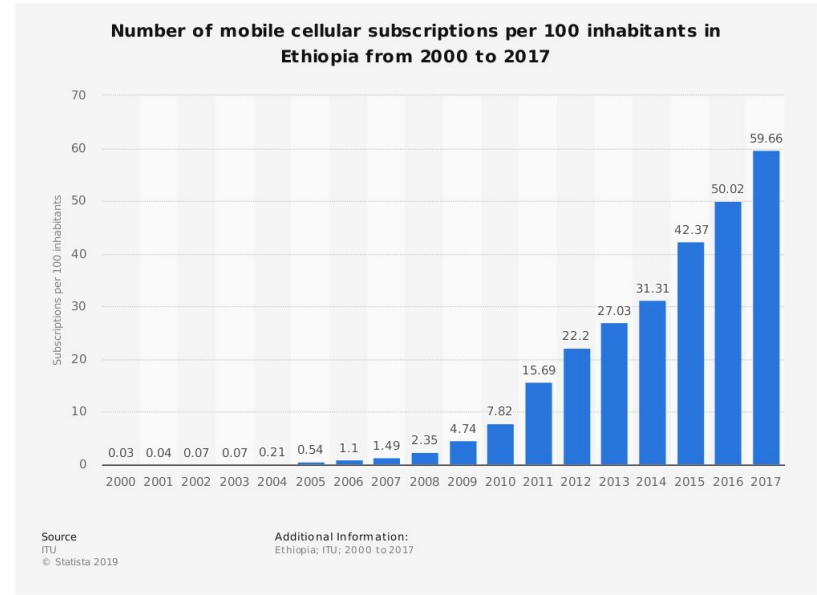
## Problem: Lack of access to past paper questions and interactive learning tools

- How do students access past paper questions for 10th grade examinations?
  - Borrowing from friends.
  - Expensive past paper questions.



## Looking Deeper into the Problem

- Lack of interactive material.
- Students in the city own smartphones.
- Smartphone coverage is expanding rapidly in rural areas.
- Using the smartphone as an interactive education tool.



Source: Statista.com

## What can be done on a smartphone?

- Encourage student engagement through reward and reinforcement learning techniques.
- Toward a Science of Learning Games - “a reward based model of behavior is shown to predict recall of newly learned information.”

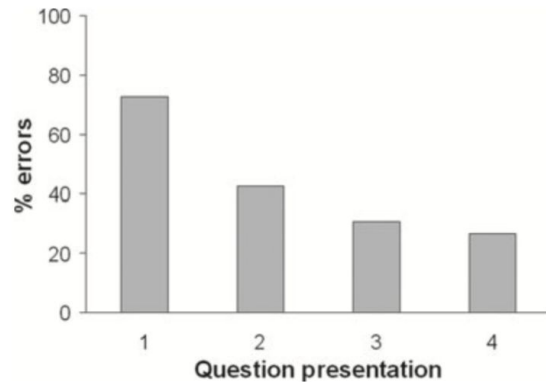
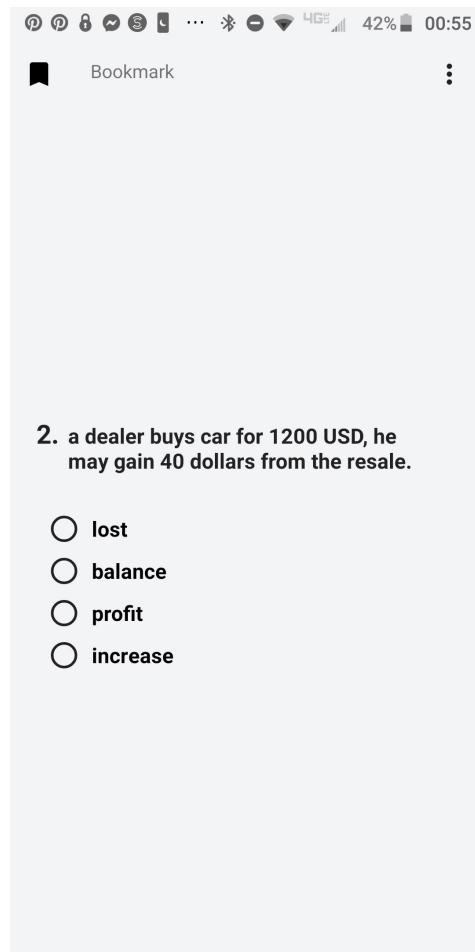


Fig. 3. Percentage error rates for questions after one presentation ( $N = 362$ ), two presentations ( $N = 280$ ), three presentations ( $N = 194$ ), and four presentations ( $N = 108$ ).



# State of the Art

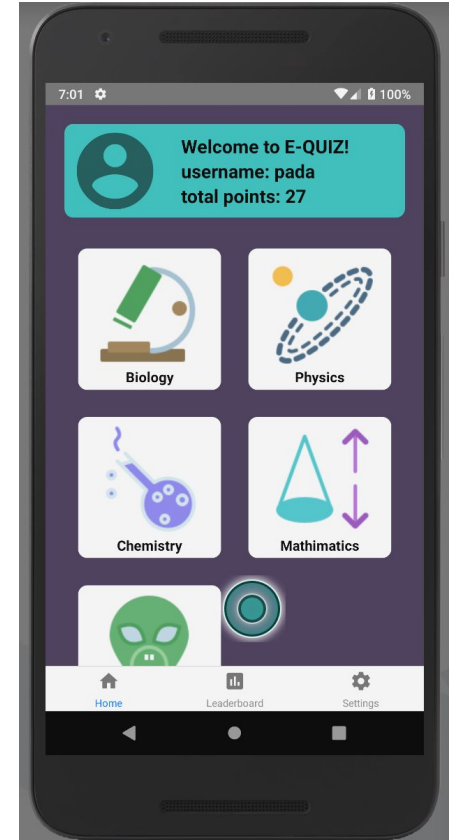
- Partially interactive books containing past papers and solutions.
- fetena.io - does not implement the reward and reinforcement method.





# Solution

- A quiz application that rewards users for participation.
- Reinforced learning by repeating incorrectly answered questions.
- Encourage competition using leaderboard.
- Increase student engagement.





## Targeted users

- High school students in Ethiopia
- Must have access to a smartphone
  - Future improvement - what about those who don't have access to a smartphone (USSD).
- High, middle, and low income students with in cities, towns, and villages with smartphone penetration.

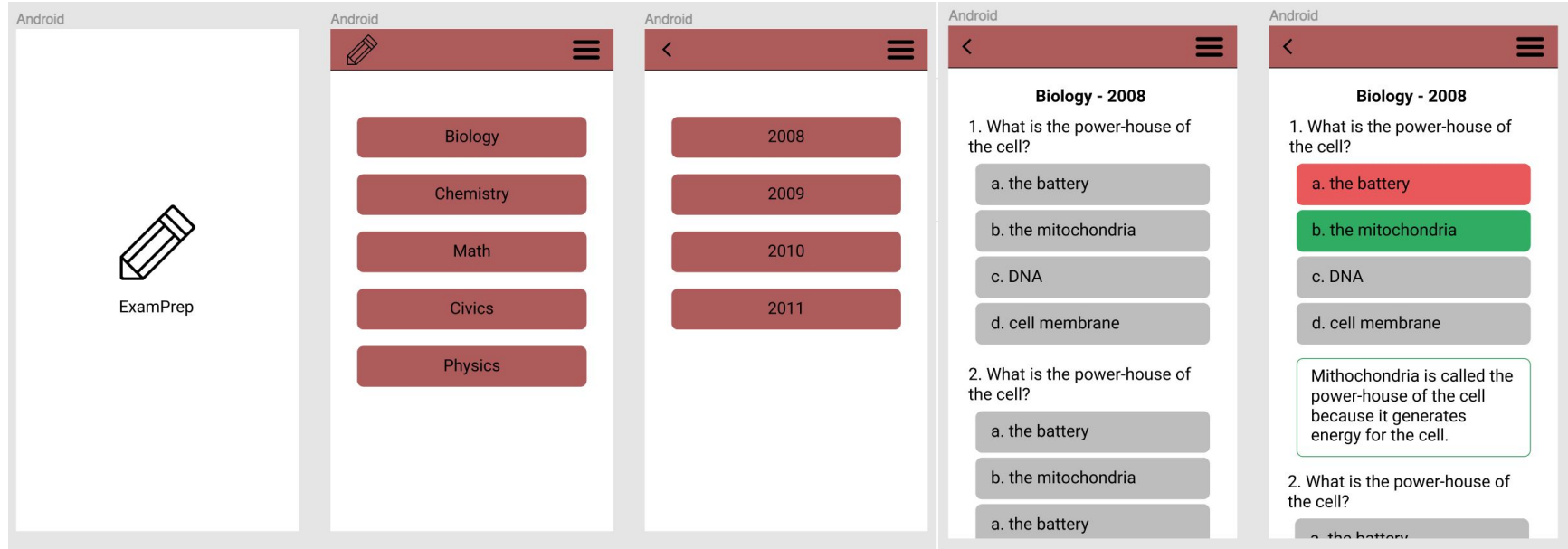


# Matrix of Alternatives

	cost	availability	ease of use	interactive	update/ durability	Total
WEIGHTS (1-3)	3	3	3	2	2	
Android App	3	2	3	3	3	45
IOS App	3	1	3	3	3	33
Web App	3	2	1	1	3	26
Desktop App	3	1	2	3	3	30
Prep books	1	2	2	2	2	23
Past papers	2	1	2	2	2	23



# Iteration 1





# Iteration 1

- Provides the resources/access.
- Interactive.
- Does not utilize reward or reinforcement learning.

“What if it was a game?”


Patrick Iradukunda ‘19

“Can you prove this improves learning?”

Dr. Eugene Santos Jr.

## Iteration 2

10:57 100%



study efficiently!

email

school, region e.g. BGS, Dire Dawa


username

password

REGISTER

Already have an account? [Login](#)

10:57 100%



study efficiently!


username

password


LOGIN

Don't have an account yet? [Signup](#)


10:55 100%




Welcome to E-QUIZ!  
username: andutest  
total points: 23




Biology




Physics




Chemistry




Mathematics






Home

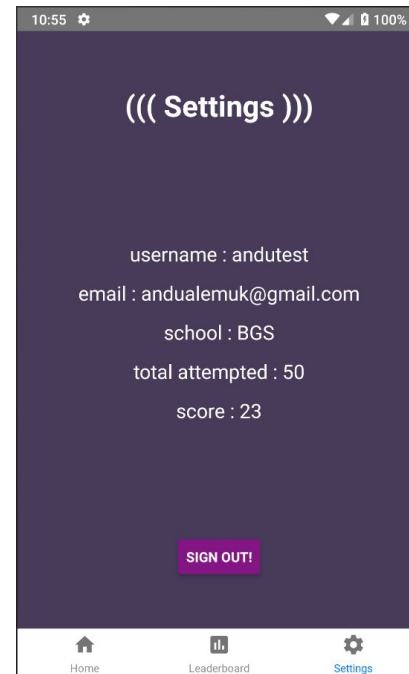
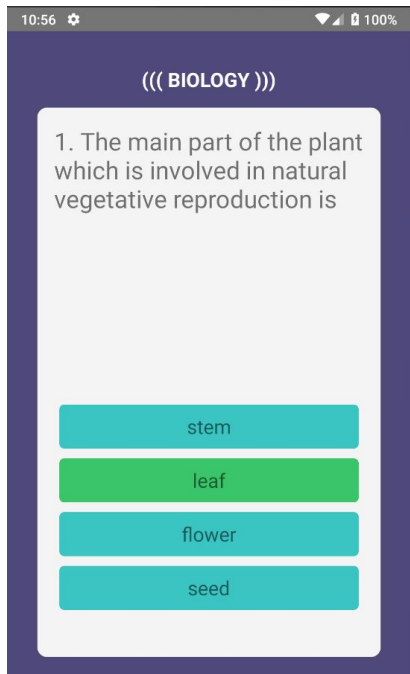


Leaderboard



Settings

## Iteration 2





## Iteration 2

- Does utilize reward or reinforcement learning.
- User signup to track progress.
- Implemented and tested with users.
  - Great as a game but not as a resource.
- Does it work in slow internet conditions?
  - Designed specially for slow connections.
  - Only transfers 5 questions at the start of the quiz.
  - Potential bottleneck - Leaderboard page.



## Technology





## Business plan

- Not designed for profit.
- Populating the database with answers and explanations from experts/teachers.
- Ad revenue.

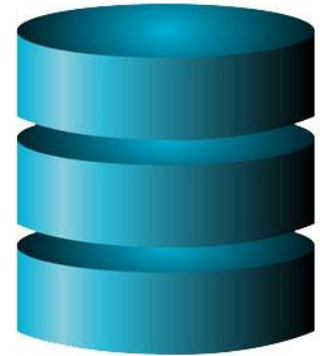
### *Marketing plan*

- Extensive marketing in my town.
- Getting the word out using social media influencers.

**DEMO**

## Future Improvements

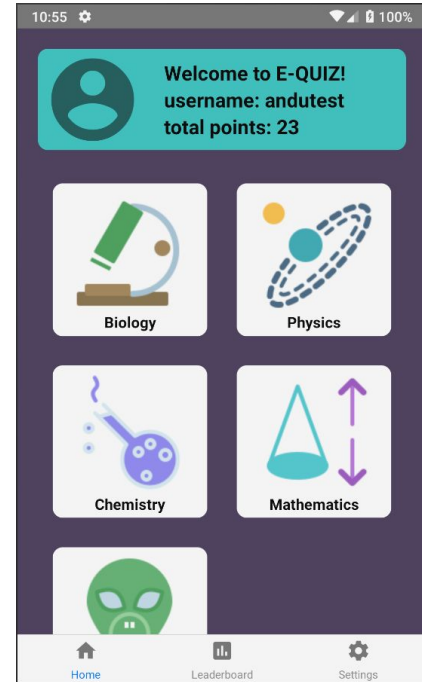
- Timed mode to simulate exam environment.
- USSD implementation to reach remote areas.
- User contribution to the database.





## Summary

Students in Ethiopia are not able to properly prepare for their national examination due to the lack of preparation resources. EthioQuiz provides these resources in a fun, interactive, and engaging manner by utilizing reward and reinforcement learning.





## References

- Paul Howard Jones,, Demetriou Skevi, Rafal Bogacz, Jee H. Yoo, and Ute Leonards, “Toward a science of learning games,” MIND, BRAIN, AND EDUCATION.
- Mobile phone penetration in Ethiopia, Data.  
<https://www.statista.com/statistics/497217/number-of-mobile-cellular-subscriptions-in-ethiopia/>
- The fetena app. Url: fetena.io
- Christopher Cheong, France Cheong, Justin Filippou, “Quick Quiz: A gamified Approach for Enhancing Learning.” Association for Information Sytems, Pacific Asia Conference on Information Systems.
- React Native Documentation. Url: <https://facebook.github.io/react-native/docs/>



# Thank you!

## Testers

- Dr. Eugene Santos Jr.
- Thayer Computer Services
- Abenezer Dara '20
- Patrick Iradukunda '19
- Job Orenge '19
- Malets Monthe '20
- Abel Kelbessa
- Eyoel Shimeles