

Exploring Virtual Reality for Enhancing English Language Skills to Face Exams like TOEFL

Dr Shenbagaraj R¹, Dr Sailesh Suryanarayan Iyer², Dr Divya Midhunchakkaravarthy³

¹ Lincoln University College; ² Lincoln University College ³ Lincoln University College

Email pdf.shenbagaraj@lincoln.edu.my

Abstract: We were motivated to write this article towards enhancing the education in general using technology and specifically to improve the English language skills needed to face the competitive exams. The proposed solutions were majorly focused on using Virtual Reality for providing the engagement needed to enhance learning. We proposed to come with proof of concept and publish the findings for acceptance of this model. The Virtual Reality Applications developed can be used by the different learners at the various levels of education from different countries. The effectiveness of the learning will be monitored and improved.

Keywords: Virtual Reality; English; Listening; Speaking; Reading; Writing;

Introduction

Education in general has been now supported by technology for better reach across the world [1]. We have been researching for a decade on using various technologies like web technologies, Instructional Design and 2D Animation. Recently, we thought of exploring 3D, gaming and Virtual Reality (VR) for adding it to our product list. We wanted to research and apply the 3D, gaming and VR to different subjects. The subjects like science, Mathematics, English were taken for the experiments. The idea was to come up with different Proof of Concepts to see the effectiveness for implementation. Government of Andhra Pradesh, India have come up with a proposals to enhance the learnability of the students using mentors for subjects like English for preparing the students at an earlier stage for the complete exams like TOEFL [2]. We were motivated by this to come up with technology models to support the students to improve their speaking skills. The need for Virtual reality based English communication program is investigated and ascertained by Kim J, Park SM, Joo M, Park J, Lee Y-L, Jang J-H, et al [3].

Related work

Similar works done by other researchers is being discussed in this section. The related work are done basically on the technologies used to support education, review articles in this area and study articles on the impact of the technologies like VR, gaming, AR used to enhance the learners experience.

Lazar, I., & Panisoara, I. O. (2018) has studied and published the usage of modern technologies in education and evolution of main digital tools over the past 20 years in work [1]. They have categorized the technologies and explored their strengths and weakness. Their results prompt improve the digital facilities to enhance learning among students.

Systematic literature review and bibliometric analysis on virtual reality and education is done by Mario A. Rojas-Sánchez, Pedro R. Palos-Sánchez and José A. Folgado-Fernández in an extensive way exploring the knowledge based VR Application in different areas of education [4]. They are also identified the scholarly articles and acceptance level of the technology among students and institutions at different time periods.

Researchers at Universiti Tun Hussein Onn, Malaysia have conducted a study using interactive simulation games to improve the English speaking ability of their students which was beneficial during their hiring [5]. They have suggested to create the games using Virtual Reality to give an immersive experience in addition to improved game aesthetics and overall appeal. Similarly, a researcher from state polytechnic of creative media, Jakarta, Indonesia have integrated the VR and digital story telling techniques to improve the English speaking skills of vocational multimedia students [6].

Researchers at Universiti Kebangsaan Malaysia also validated that VR assists in enhancing the English learner's verbal skills and suggests a comprehensive analysis on the usage of VR to confirm it.

Researchers at Faculty of Education, Universiti Kebangsaan Malaysia confirm the acceptance of the VR technology among educators. Based on these positive and encouraging feedback from the previous research from other researchers, we propose to design and develop VR models which are the proof of concept for this technologies effectiveness.

The following table compares our proposed work with the previous research done by the other researchers

Table 1. Compares this work with the related work or previous research by other researchers

Research work	Features	Advantages	Disadvantages
[9]Chotimah, 2022), (Octavianita et al., 2022)	YouTube video clip that includes subtitles, speaking practice with native speakers, and the AI Speech Recognition feature (which is to correct pronunciation).	Fun and easy to understand. Fast and efficient way to learn English.	Did not provide any technical information on how the app functioning, as it is the company's belonging.
[10] Rosetta Reflex	Use of speech	One-on-one	Use of speech

(Hoenig Stone & Batliner, 2012)	recognition technology to make utterance verification decisions, detect grammatical error, and provide feedback.	conversation practice with tutor who is a native speaker, receive immediate feedback.	recognition technology to make utterance verification decisions, detect grammatical error, and provide feedback.
[11] Plato.io (Muhammad et al., 2019)	Web Speech API for Speech Recognition to train students to speak and provide experience in conversations. p	Simple and easy interface to interact for user.	Complicated method and the need to be precise about the coding.
[12] Dialog Flow (Muhammad et al., 2020)	Using Chabot to develop English conversation. This includes speech recognition and AI technology with Dialog Flow platform as the AI engine.	Almost all the responses have high accuracy except for a few responses.	Need to be precise regarding responses, as it could cause 0% accuracy for responses.
[13]Olabs	Simulation based procedure based experience learning.	Support for varied subjects	No immersive experience
Proposed work	Completely Virtual Reality based with appealing user interface and engaging content focused towards TOEFL Exam preparation	Covers almost all aspects of the exam preparation for all age groups.	Only Proof of concept as of now before proceeding to scale up

Key Contribution

We are adding additional information to the existing body of knowledge. Our observations will be vital before taking this product for commercialization. We proposes a Focused research based implementation for TOEFLE Exams.

Implemented Work

1. ALPHABETS

The alphabets from A-Z phonics are displayed by each letter with corresponding word and a model with appropriate phonetic audio.



2. WORDS

Jungle phonics:

Question : Pick the correct animal name starts with “p” phonics (with “p” audio)

Answer : pig

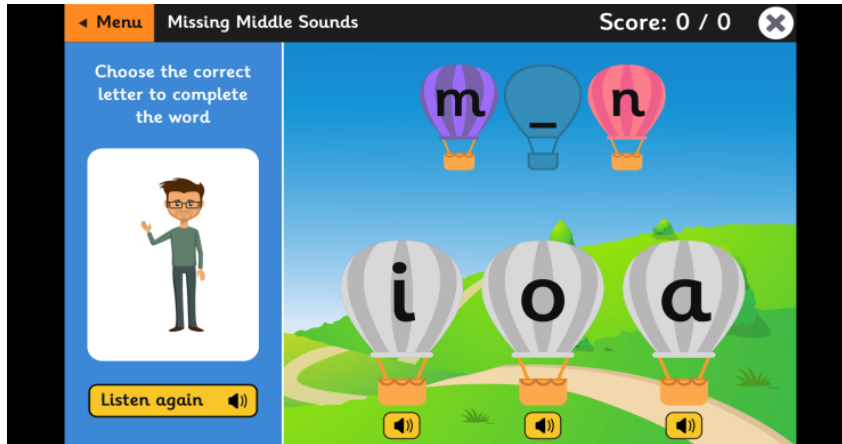
The player should correctly choose the animal name starting with “p” sound.



Balloon phonics:

Question : Display a word with empty blank space

Answer : Fill the blank with correct alphabet top form a word using phonetics audio.



Home phonics:

Question : Pick the correct object from home name starts with “t” phonics (with “t” audio)

Answer : Television

The player should correctly choose the object name starting with “t” sound.



3. SENTENCES

- The each compartment in a train displays a word which on correct arrangement forms a meaningful sentence.
- The player should form the sentence correctly before reaching destination.
- On sentence formation by switching compartments, phonetics audio for each word will be played. Finally sentence audio is played.



4. CONVERSATION

- **MONO**

A mono lecture is played for one minute and mcq question is based on audio.



- **DUAL**

A conversation between 2 person is played for one minute and mcq question is based on audio.



- **GROUP**
A classroom discussion between 4 people is played for two minute and mcq question is based on audio.



1. Pre-production

a. Concept Development

- Define goals: Enhance TOEFL preparation through gamified learning.
- Platform: Mobile (Android)

b. Game Design Document (GDD)

- Gameplay: Practice Listening, Reading, Speaking, and Writing in mini-game formats.
- Mechanics: Drag-and-drop for sentence ordering, voice recording for speaking tests, timer-based quizzes.

- UI/UX: Simple navigation for educational focus.

c. Technical Planning

- Unity version: LTS release for stability (e.g., Unity 2022.3 LTS).
- Core tools: Speech Ace.

d. Scriptwriting

- Scripts for dialogues, scenarios, instructions, and in-game feedback.
- Use of natural English expressions and clear pronunciation for realism.

2. Characters and Environment Design Production

a. Characters

- Tutor character:
- NPCs: Test examiners, classmates, or scenario participants.
- Style: low-poly 3D to maintain performance on mobile.

b. Environments

- Locations: Classroom, museum, farm, village etc.
- Design philosophy: Realistic enough for immersion but stylized to be engaging.
- Tools: Adobe Photoshop, Blender for 3D modelling.

c. UI Elements

- Icons, buttons, HUD, progress bars, timers—all designed for clarity.
- Color-coded sections for each TOEFL skill.

3. 2D Animation

a. UI Animations :

- Button animations in quiz sections for hover, press, and selection states.
- Feedback animations to show correct/incorrect answers, score updates, and progress.
- Transition scenes with smooth animations between different game sections (e.g., from main menu to quiz).

4. 3D Modelling and Animation

a. Modelling

- Characters: Low-poly models optimized for mobile.
- Environments: Modular interior assets like desks, chairs, exam booths.
- Tools: Blender, Maya.

b. Rigging & Animation

- Rigging of NPCs and tutor using Mixamo or custom rigs.
- Speaking gestures, idle loops, and interaction animations (e.g., writing or listening).
- Exported to Unity with FBX format and configured with Animator Controller.

c. Optimization

- Light baking, LOD systems, and mobile shader optimizations.
- Use of Unity's Universal Render Pipeline (URP) for efficient rendering.

5. Post Production

a. Testing

- QA across devices, screen resolutions, and input methods.
- Usability testing with language learners for feedback on comprehension and UI.

b. Polish

- Final UI/UX tweaks.
- Enhanced audio (cleaned voice lines, ambient SFX, background music).

c. Deployment

- Platform builds (APK).

Results

Category of Users	Numbers	Feedback	Percentage of Acceptance
Internal Teachers	10	Good Work	99%
Quality Control	5	Excellent Work	100%
Management Audit	3	Superb Work	100%
External Teachers	110	Very Good	99%
Education Administration	10	Interesting Work	99%
Learners	1127	Good one	99%

Parents	237	Very Helpful	100%
General Public	567	Quite Helpful	99%

Conclusion

1. Virtual Reality based solution provided and results were motivating to proceed further.
2. Qualitative and Quantitative methods were used for data collection and getting feedback.
3. Learners were showing interest and learning.
4. Tested for limited users and should be made scalable.

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