



Google Developer Group
On Campus

TechSprint



Leveraging the power of AI



Team Details

- a. **Team name:** GREENCO Hackers
- b. **Team leader name:** T . Balu
- c. **Problem Statement:** Disaster Preparedness and Response Education System for Schools & Colleges

Problem statement

- ❖ During disasters such as fires, floods, and earthquakes, many students and individuals do not know how to react correctly.
- ❖ Disaster preparedness is mostly taught through textbooks, instructions, or guidelines, which do not provide practical experience.
- ❖ Physical disaster drills are risky, expensive, and difficult to conduct frequently for large groups.
- ❖ Due to this lack of practical training, people panic during real emergencies, make unsafe decisions, and fail to follow proper safety procedures.
- ❖ There is a critical need for a **safe, practical, and engaging disaster preparedness learning approach** that helps individuals understand *how to respond correctly before a real disaster occurs*.

Addressing Problem

- ❖ **Safe learning environment:** Eliminates risks of physical disaster drills while ensuring practical preparedness.
- ❖ **Boosts awareness:** Helps students visualize and practice correct responses, reducing panic in real emergencies.
- ❖ **Personalized training:** Different disaster modules for different regions (floods, earthquakes, fires).
- ❖ **Higher engagement:** Interactive simulations keep students more engaged than paper-based guidelines.
- ❖ **Repeatable practice:** Students can practice disaster response multiple times to build confidence and accuracy.

POTENTIAL IMPACT

- ❖ **Fostered preparedness:** Regular AR/VR drills and digital modules ensure students and staff are always ready for emergencies.
- ❖ **Encouraged awareness culture:** Promotes a culture of disaster awareness and resilience across schools and colleges.
- ❖ **Improved accessibility:** Students can access disaster learning modules anytime, anywhere, in multiple languages.
- ❖ **Initial implementation challenges:** Cost of VR hardware can be mitigated with mobile-based AR simulations.

FEASIBILITY

- ❖ **Technical:** Can be built using Unity, Unreal, WebXR and run on mobiles/VR devices.
- ❖ **Financial:** Affordable with open source tools ;AR works on smart phones, VR optional.
- ❖ **Operational:** Easy to integrate with e-learning systems.
- ❖ **User-friendly:** Minimal training needed; interactive and intuitive modules.
- ❖ **Scalable:** Can expand to cover multiple disaster scenarios and large user groups.

Innovation and Uniqueness

- **Virtual drills on-demand:** Students can practice anytime, anywhere.
- **AI-powered adaptive learning:** System evaluates student performance and suggests improvements.
- **Inclusive accessibility:** AR mode available on smartphones, ensuring low-cost adoption.
- **Gamified safety scores:** Track preparedness levels with leaderboards.



Key features of the solution

- **Interactive disaster simulation modules** for emergencies such as fires, floods, and earthquakes.
- **Step-by-step evacuation guidance** to train users on correct safety procedures.
- **Gamified learning system** with points, badges, and leaderboards to encourage active participation.
- **Performance tracking dashboard** to monitor preparedness levels and learning progress.
- **Region-specific training scenarios** tailored to different geographical disaster risks.
- **Repeatable virtual practice sessions** allowing users to train anytime without physical risk.

Technology Stack

Frontend:

HTML, CSS, JavaScript, React.js

Gamified Learning Logic:

JavaScript-based scoring system, levels, badges, and leaderboards

Google Technologies

Backend & Database (Google):

Firebase Authentication, Firebase Firestore

Hosting (Google):

Firebase Hosting

Version control :

GitHub



Firebase Authentication





Process Flow of the Solution



Future Scope & Vision

While this project is developed as a functional prototype, its real strength lies in its potential impact. If integrated into educational systems, this platform can help students clearly understand disaster preparedness from an early stage.

With continued development, students and educators can expand this foundation into more advanced solutions, driving greater awareness, innovation, and large-scale adoption.

Over time, such initiatives can contribute to building a more prepared society and ultimately help **reduce loss of life during real disasters**.

Disaster preparedness education can inspire students to contribute meaningfully to disaster management and community safety.

Scalability & Accessibility

- ☐ Support for **multiple languages** to increase inclusivity.
- ☐ Mobile and low-bandwidth versions for **rural and remote regions**.

Prototype



Snapshots of the MVP



Project Links & Demo

1. GitHub Public Repository – <https://github.com/BALU-216/Disaster-Preparedness-training.git>
2. Demo Video - <https://drive.google.com/file/d/1-iwEyRoDCSOlyxUBQKqhXWSTAvxLJdkc/view?usp=sharing>
3. MVP link - <https://tinyurl.com/vr-training-simulation>



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Thank you!

