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Title **TRACING DETAILS OF UNIDENTIFIED PARTICIPANTS WHILE ACADEMIC SESSIONS**

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TRACING DETAILS OF UNIDENTIFIED PARTICIPANTS WHILE ACADEMIC SESSIONS.

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ABSTRACT

Online learning has become most popular and convenient now-a-days. More and more universities and colleges are offering online course to increase enrolment. Education can become transformative when teachers and students synthesize information across subjects and experiences, critically weigh significantly different perspectives, and incorporate various inquiries. Educators are able to construct such possibilities by fostering critical learning spaces, in which students are encouraged to increase their capacities of analysis, imagination, critical synthesis, creative expression, self-awareness, and intentionality. A by-product of fostering such new approaches has been the creation of online courses developed in the United States and worldwide at exponential speed. It is becoming increasingly common at many higher education institutions, offering fully online and/or hybrid/blended courses combining online instruction with face-to-face teaching. Some students cause indiscipline, confusion and use foul abusive languages to disturb the whole meeting. We are building a firewall and preventing the intruders to enter our meeting/academic session. Thus, it reduces the number of students a host has to pay special attention to for the purpose of preventing disturbance.

Keywords: Firewall, Email Verification, Registration, Material UI, Database.

1. INTRODUCTION

With the development of online education over time, its definition has been evolved. Regarding the aspects of the conversion from face-to-face classrooms to online, McIsaac and Gunawardena (1996) defined distance education as “no more than a hodgepodge of ideas and practices taken from traditional classroom settings and imposed on learners who just happen to be separated physically from an instructor. Regarding the aspects of technology and organization, Moore and Kearsley (2012) defined that “distance education is teaching and planned learning in which teaching normally occurs in a different place from learning, requiring communication through technologies as well as special institutional organization. Regarding the aspects of being distant, Finch and Jacobs (2012) defined it as “all forms of teaching and learning where the student and instructor are separated geographically and temporally. It is noted that there is the purported need for conceptualizing distance education in rapidly changing technology and exponentially growing online education, but its various aspects make it difficult to agree on just one definition and on what constitutes distance education in practice.

New learning curricula emerged as a result of the introduction of applications in the education sector. In mobile applications, there are fun activities that engage children in a healthy mental process and help them see things from a different perspective. Students who participate in learning can access the materials long after they leave the school grounds. Educators can interact with their students online,

offer tests, and provide other resources for them to watch in their spare time, such as educational movies.

Students are more involved in the learning process when they are asked to perform independently and on their terms.

More than a decade of intensive research has convincingly demonstrated that the Web is an effective medium for teaching, with student learning outcomes and student satisfaction at least as good as those for classroom-based students (See, for example, Gerhing, 1994; Golberg, 1997; McCollum, 1997; and the No Significant Difference website). Many Colleges and Universities now offer Internet-based educational opportunities, and learner registration in online learning courses and programs has increased exponentially through the 1990s and into the new millennium. Online education has become the leading modality for distance education, and academic leadership expects online enrolment to grow as much as 25% per year (Sloan Consortium, 2007).

Even more significantly, experience and research have shown that design plays a critical role in the success of online courses and programs. “Online courses” which ask learners to read pages of text and compete automated quizzes or rote tasks are doomed to failure. It is impossible to establish effective virtual learning environments by trying to create ‘virtual versions’ of materials, activities and teaching strategies that we know to be successful in a traditional classroom. Learners may also find that the ‘learning strategies’ they have used successfully in face-to-face classrooms don’t ‘work’ online.

2. LITERATURE SURVEY

In today’s world e-learning is flexible platform. In today’s education system e-learning is giving the new dimensions to improve the quality of knowledge. In this era internet is massively being used by everyone. The education field is trying to change the standards by using the e-learning platform. In this literature review we are going to discuss about e-learning, hybrid learning and blended learning and also going to define 3 types of learning. We are also going to compare all the 3 types of learning. Our main focus will be on online learning or education. We will find the factors that are affecting the learning experience. Some of the major factors are spaces, learning community and student identity, course design and the educator’s role (Bryman, 2012; Creswell, 2013; Machi & McEvoy, 2016). The ongoing COVID-19 pandemic poses significant challenges to the global education system. By July 2020, the UN Educational, Scientific and Cultural Organization (2020) reported nationwide school closure in 111 countries, affecting over 1.07 billion students, which is around 61% of the global student population. Traditional brick-and-mortar schools are forced to transform into full-time virtual schools to provide students with ongoing education (Van Lancker & Parolin, 2020). Consequently, students must adapt to the transition from face-to-face learning to fully remote online learning, where synchronous video conferences, social media, and asynchronous discussion forums become their primary venues for knowledge construction and peer communication.

2.1 Review on technical issues during online classes.

Technical issues surrounding technological devices could also influence students’ experience in online learning. (Barbour & Reeves, 2009) argues that students need to have a high level of digital literacy to find and use relevant information and communicate with others through technological devices. Students lacking this ability could experience difficulties in online learning. Bączek et al. (2021) found that around 54% of the medical students experienced technical problems with IT equipment and this issue was more prevalent in students with lower years of tertiary education. Likewise, Niemi and Kousa (2020) also find that students in a Finish high school experienced increased amounts of technical problems during the examination period, which involved additional technical applications.

These findings are concerning as young children and adolescent in primary and lower secondary school could be more vulnerable to these technical problems as they are less experienced with the technologies in online learning (Barbour & LaBonte, 2017). Therefore, it is essential to investigate the learning conditions and the related difficulties experienced by students in K-12 education as the extend of effects on them remain underexplored.

2.2 Review on learning experience and interactions

Apart from the aforementioned issues, the extent of interaction and collaborative learning opportunities available in online learning could also influence students' experience. The literature on online learning has long emphasized the role of effective interaction for the success of student learning. According to Muirhead and Juwah (2004), interaction is an event that can take the shape of any type of communication between two or subjects and objects. Specifically, the literature acknowledges the three typical forms of interactions (Moore, 1989): (i) student-content, (ii) student-student, and (iii) student-teacher. Anderson (2003) posits, in the well-known interaction equivalency theorem, learning experiences will not deteriorate if only one of the three interaction is of high quality, and the other two can be reduced or even eliminated. Quality interaction can be accomplished by across two dimensions: (i) structure—pedagogical means that guide student interaction with contents or other students and (ii) dialogue—communication that happens between students and teachers and among students. To be able to scale online learning and prevent the growth of teaching costs, the emphasize is typically on structure (i.e., pedagogy) that can promote effective student-content and student-student interaction. The role of technology and media is typically recognized as a way to amplify the effect of pedagogy (Lou et al., 2006). Novel technological innovations—for example learning analytics-based personalized feedback at scale (Pardo et al., 2019) —can also empower teachers to promote their interaction with students.

2.3 Literature Review On E-Learning Adoption

Despite the enormous growth of e-learning in education and its perceived benefits, the efficiency of such tools will not be fully utilized if the users inclined to not accept and use the system. Therefore, the successful implementation of e-learning tools depends on whether or not the students are willing to adopt and accept the technology. Thus, it has become imperative for practitioners and policy makers to understand the factors affecting the user acceptance of web-based learning systems in order to enhance the students' learning experience (Tarhini et al., 2014a). However, recent studies have shown that e-learning implementation is not simply a technological solution, but also a process of many different factors such as social factors (Schepers and Wetzels, 2007; Tarhini et al., 2014b; 2015), and individual factors (Liaw and Huang, 2011), organizational such as facilitating conditions (Sun and Zhang, 2006) in addition to behavioral and cultural factors (Masoumi, 2010). Such major factors play an important role in how an information technology is developed and used (Kim and Moore, 2005). Fischer et al. (2015) studied how proceedings of scientific conferences can be used for trend studies in the field of e-learning. They examined the abstracts of 427 scientific articles of leading German-speaking e-learning conferences Gesellschaft für Medien in der Wissenschaft and E-Learning-Fachtagungen der Gesellschaft für Informatik e. V. (GMW and DeLFI) – published from 2007 to 2013. The study was conducted at German-speaking conferences and, thus, reflects the situation in Germany, Switzerland and Austria. Fischer et al. (2015) made an important contribution to the diffusion of digital media in higher education. The researchers found that the detailed analysis of the frequency distribution over the seven years reflects the intensity of scientific discussion towards e-learning trends, and conclusions about the didactical or technical potentials of innovations can be introduced. Specifically, they found the development potential of learning management, mobile learning, virtual worlds, e-portfolio, social media and Massive Open Online Courses are crucial for e-learning in German higher education. Moravec et al. (2015) showed how e-learning tools impact

students' achievement. The study was attended by nearly 2000 students. According to Moravec et al. (2015), the study compares the results of questions from the area of law where the tool was provided in a pilot version with the results of questions, where the e-learning tool was not provided. The researchers found that the e-learning tools have affected the students' results. Nevertheless, the belief of the e-learning tool may possibly have a negative effect on students who will depend on given materials was disproved. By using the Cohen's model and based on data collected from 15 documents from relevant research studies conducted on the effect of ICT based e-learning on academic achievement during 2010-2012, Mothibi (2015) examined the relationship between e-learning and students' academic achievement in higher education. The researcher found that ICT had a statistically significant positive influence on e-learning based students' academic achievements. The results also indicated that ICT had a significant positive influence on students' educational overall academic achievements. Scholtz and Kapeso (2014) and Almajali et al (2016), Shannak (2013) explored the factors of mobile learning (m-learning) approaches which can be used for enterprise resource planning (ERP) system. The technology acceptance model (TAM) was applied to assess the acceptance, usefulness and perceived ease of use of the m-learning. The researchers found that the m-learning system was correlated positively for perceived ease of use and perceived usefulness as such findings confirmed other studies which stressed the importance of the quality of course content in e-learning and m-learning projects.

Research into virtual learning emphasizes the importance of the connection between students and their teachers. This can be lost if there is no 'live' contact element at all. As Beale notes, this does not necessarily mean that every lesson needs to include a video meeting, though there is a beneficial psychological impact of knowing that the teacher is still in contact and regular face-to-face online discussions can enable this. There are other forms – a discussion thread which begins during a lesson and is open throughout can perform the same role, though in cases where meeting functions are available, students may be directed to use these rather than email. As well as the teacher-student relationship, student-student links are important. There is evidence of improved learning when students are asked to share their learning experiences with each other.[16]

Beale's research summary also emphasizes the importance of a supportive and encouraging online environment. Distance learning is challenging for students and the experience can be frustrating and de-motivating if technology fails (e.g., if work gets lost or a live session cannot be joined due to a connection failure or time-zone difference). More than ever, teachers need to work at providing positive encouragement to their students, praising and rewarding success and acknowledging challenges when they exist. It is also valuable if teachers can identify new skills that students are acquiring – not least skills in problem-solving, using information technology and resilience – and encourage their classes when they see evidence of these.

A helpful summary of research about online learning by Jonathan Beale at CIRL contains an outline of principles concerning successful online distance learning programs. The summary explores research-based recommendations for effective teaching and learning practices in online and blended environments made by Judith V. Boettcher and Rita-Marie Conrad in their 2016 work, *The Online Teaching Survival Guide: Simple and Practical Pedagogical Tips*. [13] A central emphasis of these recommendations is that successful online learning depends upon the formation of an online learning community, and this is only possible if there is regular online interaction between teachers and students.

3. PROPOSED SYSTEM

Email verification is the process of checking an email address for being existent and active, aka valid. A valid email is the one that can receive messages from other senders. Every email verifier, either

bulk or single, performs (or is at least supposed to) multiple steps of the verification process. The most common are the syntax, domain, catch-all, and MX record checks, as well as email address ping.

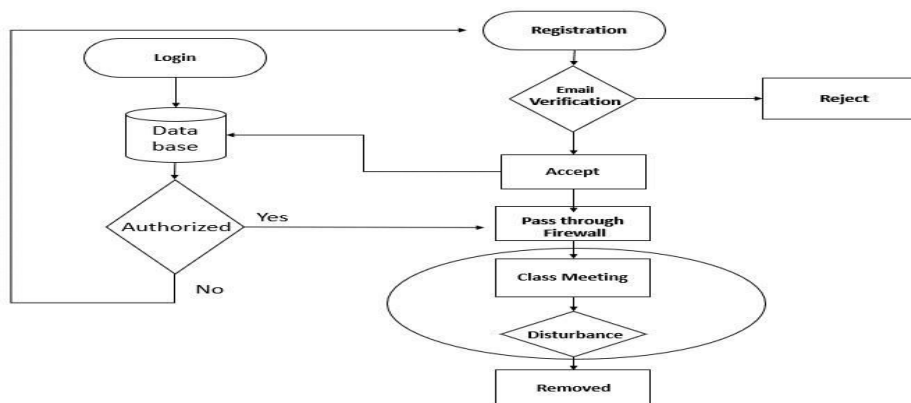
In online classes for every student to save their data in our database we have to check their emails. We are going to verify their mails and save their student data in our database. And we will allow the students to the online academic sessions only if their data is present in the database. If not present in the database we will have to make them register for the online classes by using a unique id.

We will find the intruders/miscreants so that solutions need to be devised. Intruders will not be able to use the details of registered Participants/Students. Host will have the authority to remove/block intruders. We are building a firewall to protect our academic session. We are sending email verification for the users E-mail ID. So that intruders cannot enter with fake ID's or use authorized persons data to join the meeting.

If the students cause any disturbance while academic sessions, their data in the database will be stored in the blacklist. They will not be further allowed to the academic session to provide peaceful and healthy environment to the students who want to gain their knowledge and prove themselves. As we are going to give unique code to the students of our campus based on their roll number we can easily find the culprits even if they register with new E-mail ID's.

3.1 Advantages of proposed System

- Online classes have eliminated the necessity of travelling daily to attend coaching classes.
- One of the key advantages of virtual classrooms is that you can save your energy, time and money.
- online learning is that you can clarify your doubts instantly on the spot with the online teacher.
- The importance of online classes is that they are much more convenient and flexible as compared to traditional learning platforms.
- By taking online classes, you strengthen your self-discipline in other aspects of your life such as physical fitness, mental stability and even build better relationships.
- In our proposed system students can learn with no disturbance.
- Here more privacy and security will be provided to the students.
- We can have a peaceful and healthy environment while attending online classes.
- We can identify the intruders/miscreants of the class and block them without interrupting our classes.
- It's possible to connect with teachers and learners all around the world with online courses.
- Even if you're learning something that isn't necessarily culture or country-specific, learning with people from different backgrounds can lend fascinating perspectives and discussion to the topic.



The system architecture contains all the processes that we are using in this project. When a user is new to the classes, he will register for the online classes. When a user registers for the class he has to verify his email that he used while registering. If he cannot verify the E-mail ID that he used while registering to the class he will be rejected for registering to the class. When a user is already a member of the class, he can directly join the class by login into the session. When a user login to the session if the user's data is already in the database, he will be redirected to the class. Otherwise, he will be redirected to the registration page. While joining the session, if the person is authorized then he will pass through the firewall that was built to prevent the intruders from joining the class. After joining the session, if he causes any mischief for disturbing the class, he will be removed from the session immediately. And that student's data will be added to the database as blocked person and he will not be allowed to the session again. This way we can provide more peaceful environment for the students who are attending our online sessions.

we have mainly built a web application which contains some steps for joining the class. First of all, after opening the secure login page an option for sign in will be displayed. If the user is either host or already registered student, he/she can enter their login details and can join the class. If the user is new to the class and does not have an account, he needs to signup first. In the sign in page itself, we have an icon with signup on it. If we select signup option, it will ask you to enter your details. After filling the details u can enter signup and a screen will be displayed saying your account is on hold and you (the authorised email user) need to verify it. After verifying the email, you are now ready with an account. And now you need to sign in with the credentials you have given during signup. After signing in you will be displayed with a QR code. If you scan the QR code using the google authenticator, a secure login OTP will be displayed, which will take you to the class. And the QR code OTP will be only valid for 30 seconds. And after the 30 seconds are over a new login OTP will be displayed. And this is the process in the student part. And coming to the host part, the teacher will be given the role of faculty, and the faculty have all the rights to access who can join the class and who cannot join the class. A screen will be displayed to the faculty with all the names of the students in the database. And at first all the users, despite of their email being verified or not, every student will be in the blocked mode. And the host has to unblock the student with those mails that are verified. After unblocking them the student is free to join the class using secure login OTP. And if any student who is responsible for any misbehaviour and causing disturbance in the class, the concerned faculty can block the user's mail ID from the database permanently. Such that the remaining students can learn and improve their skills in peace.

Backend

All the back is done using the firebase

Index module all the remaining modules are imported and executed through export function.

Export - The export declaration is used to export values from a JavaScript module. Exported values can then be imported into other programs.

authentication module here the password of the user is verified.

db module Create a user and store it at users/id path (it's an asynchronous function)

Updating the users object, temp secret in db.

Returns all users from firebase real time db.

Unlike how API keys are typically used, API keys for Firebase services are not used to control access to backend resources; that can only be done with Firebase Security Rules (to control which users can

access resources) and App Check (to control which apps can access resources). Usually, you need to fastidiously guard API keys (for example, by using a vault service or setting the keys as environment variables)

But here the config is being used for both development and production environment. Though, it is a best practice creating a second project and have two configs: one for production (product Config) and another for development (development Config), so you choose the config based on the environment.

Fire store - We have two options with Firebase, i.e., Firebase Real-time Database, which we learned in our previous section and Cloud Fire store. Cloud Fire store is newer, but it is not replacing the Firebase Real-time Database. Cloud Firestore is a flexible as well as scalable NoSQL cloud database. It is used to store and sync data for client and server-side development. It is used for mobile, web, and server development from Google Cloud Platform and Firebase. Like the Firebase Real-time Database, it keeps syncing our data via real-time listeners to the client app. It provides offline support for mobile and web so we can create responsive apps that work regardless of network latency or Internet connectivity.

Firestore Authentication - Firestore Authentication provides backend services, easy-to-use SDKs, and ready-made UI libraries to authenticate users to your app. It supports authentication using passwords, phone numbers, popular federated identity providers like Google, Facebook and Twitter, and more.

Firestore Authentication integrates tightly with other Firestore services, and it leverages industry standards like OAuth 2.0 and OpenID Connect, so it can be easily integrated with your custom backend.

firebase.initializeApp (config) - `firebase.initializeApp (config)` this function is used to add Firestore to your JavaScript project

steps to add firestore to our project

step 1 - Create a Firestore project and register your app

step 2 - Install the SDK and initialize Firestore

step 3 - Access Firestore in your app

Frontend

The frontend of this project is a webpage it uses some of the features such as

QR code - A QR code is a monochromatic matrix with embedded data that is used in manufacturing industries in order to label the products.

Speakeasy - Speakeasy is a one-time passcode generator, ideal for use in two-factor authentication, that supports Google Authenticator and other two-factor devices.

useState - The React useState Hook allows us to track state in a function component. The React useState Hook allows you to have state variables in functional components. You pass the initial state to this function, and it returns a variable with the current state value (not necessarily the initial state) and another function to update this value.

State generally refers to data or properties that need to be tracking in an application.

Components - Components are independent and reusable bits of code. They serve the same purpose as JavaScript functions, but work in isolation and return HTML. Components come in two types,

Class components and Function components. The magic of components lies in their reusability: you can create components that are composed of other components. But as you nest more and more components, it often makes sense to start splitting them into different files. This lets you keep your files easy to scan and reuse components in more places.

Home page

This is a React component that represents the home page of a web application. The home page displays a greeting message to the user along with some other information. It also provides the user with the option to verify their identity using a Time-based One-Time Password (TOTP). The component imports and uses several packages, including React, speakeasy, and qrcode.

The component fetches user data from Firebase and stores it in its state. It uses the `componentDidMount()` lifecycle method to do this. Once the data is loaded, the component renders the user's username and a checkmark or an 'X' depending on whether the user is verified or not.

The component provides a form for the user to enter an OTP. When the form is submitted, the component verifies the OTP using speakeasy. If the verification is successful, the component updates the user's secret and verified status in Firebase. If the user does not have a secret yet, the component generates one using speakeasy and displays it as a QR code.

The component also checks whether the user's account is blocked. If the account is blocked, the component displays a message informing the user that their account is on hold and they need to contact the respective faculty to get it unlocked.

Overall, the component provides a secure way for users to verify their identity using TOTP and update their secret and verified status in Firebase.

Sign up page

This code is a React component that defines a form for user signup in a React application using Firebase authentication.

The form consists of four input fields for username, email, password, and confirm password. There are two buttons, one of them is the "Sign Up" button which is used to submit the form, and the other one is a link to the "Sign Up" page, which is displayed for users who don't have an account registered yet. The Signup Form component receives a prop named history, which is used to redirect the user to the homepage after a successful sign-up. The component is also initialized with an object named INITIAL_STATE, which holds the initial state of the component.

The `onSubmit` function is executed when the "Sign Up" button is clicked, and it calls the Firebase `doCreateUserWithEmailAndPassword` method to create a new user account using the provided email and password. If the user account is created successfully, a new user is also created in the Firebase real time database using the `doCreateUser` method. If an error occurs while creating the user account, an error message is displayed using the Alert component.

The `byPropKey` function is used to update the state of the component when an input field is changed. This function returns another function that sets the value of the property passed to it as an argument to the value passed to it as another argument. The `onChange` function of each input field calls the `byPropKey` function to update the state of the component when an input field is changed.

The `isInvalid` variable is a Boolean value that is used to perform validation. If the passwords don't match, or any of the input fields are empty, the `isInvalid` variable is set to true. If `isInvalid` is true, the "Sign Up" button is disabled.

The Signup Link component is a simple link that redirects the user to the "Sign Up" page if they don't have an account registered yet.

Sign in Page

This is a React component that renders a sign-in form. The form includes two input fields for email and password, a submit button, and links to sign up and reset the password. The form also includes an alert component that displays an error message if there is an authentication error.

The component imports various modules from React and other libraries, such as react-router-dom, reactstrap, and Firebase. It defines a Sign in Page function component and a Sign in Form class component. The Sign in Page component simply renders the Sign Inform component, as well as the sign-up and password reset links.

The Sign in Form component is a class component that manages the form's state, including the email, password, error, and showingAlert properties. The component defines methods for handling form submission, Facebook login, and displaying the alert component for errors. The onSubmit method calls the Firebase authentication service's doSignInWithEmailAndPassword method to sign in the user with the provided email and password. If the sign-in is successful, the method retrieves the user's role from Firebase Firestore and redirects the user to the appropriate page based on their role. If there is an authentication error, the method sets the error property and calls the timer method, which sets the showingAlert property to true for four seconds before setting it back to false. The Facebook login method calls Firebase authentication service's doFacebookSignIn method to sign in the user using their Facebook credentials. If the Facebook login is successful, the method creates a user in Firebase Firestore with the user's Facebook information and redirects the user to the Home page.

Finally, the component renders a form with input fields for email and password, a submit button, and an alert component for displaying errors.

Authentication

This is a higher-order component (HOC) that provides authentication functionality to a wrapped component. It uses Firebase's onAuthStateChanged() method to listen for changes in the authentication state, and sets the authUser state accordingly. It then passes down the authUser value through a context provider so that any child components can access it.

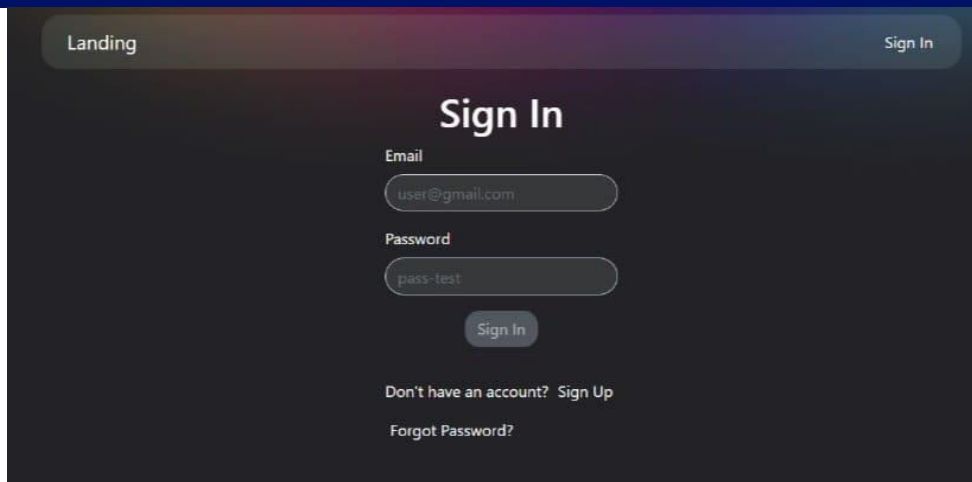
The componentDidMount() lifecycle method is used to set up the onAuthStateChanged() listener when the component is first mounted. When a user signs in or signs out, this listener is triggered and the authUser state is updated accordingly.

Inside the onAuthStateChanged() listener, there is an additional call to Firebase's doGetAnUnser() method to retrieve the user's role from the Firestore database. If a user is authenticated, their role is added to the authUser object before it is stored in the component's state.

Finally, the wrapped component is rendered inside the render() method, with the authUser value passed down through the AuthUserContext.Provider.

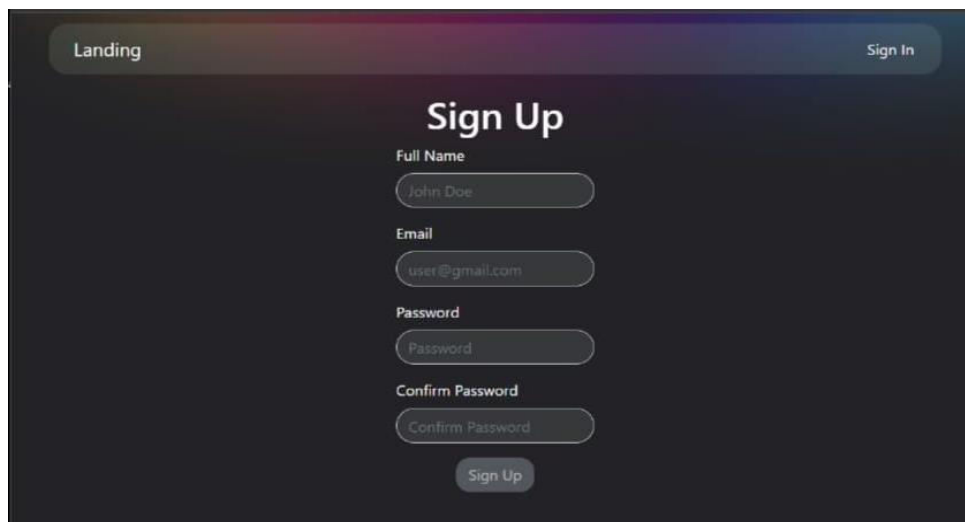
4. RESULTS AND DISCUSSION

The initial page for any user will be displayed as follows for signing in or signing up and joining the class.



The screenshot shows a dark-themed 'Sign In' page. At the top left is a 'Landing' button and at the top right is a 'Sign In' button. The main heading is 'Sign In'. Below it are two input fields: 'Email' with the value 'user@gmail.com' and 'Password' with the value 'pass-test'. A 'Sign In' button is centered below the fields. At the bottom, there are two links: 'Don't have an account? Sign Up' and 'Forgot Password?'.

If the user doesn't have an account with his email, that person has to sign up for joining the class.



The screenshot shows a dark-themed 'Sign Up' page. At the top left is a 'Landing' button and at the top right is a 'Sign In' button. The main heading is 'Sign Up'. Below it are four input fields: 'Full Name' with the value 'John Doe', 'Email' with the value 'user@gmail.com', 'Password' with the value 'Password', and 'Confirm Password' with the value 'Confirm Password'. A 'Sign Up' button is centered below the fields.

After sign up an email will be shared to the registered email ID for verification. The link will be as show below:

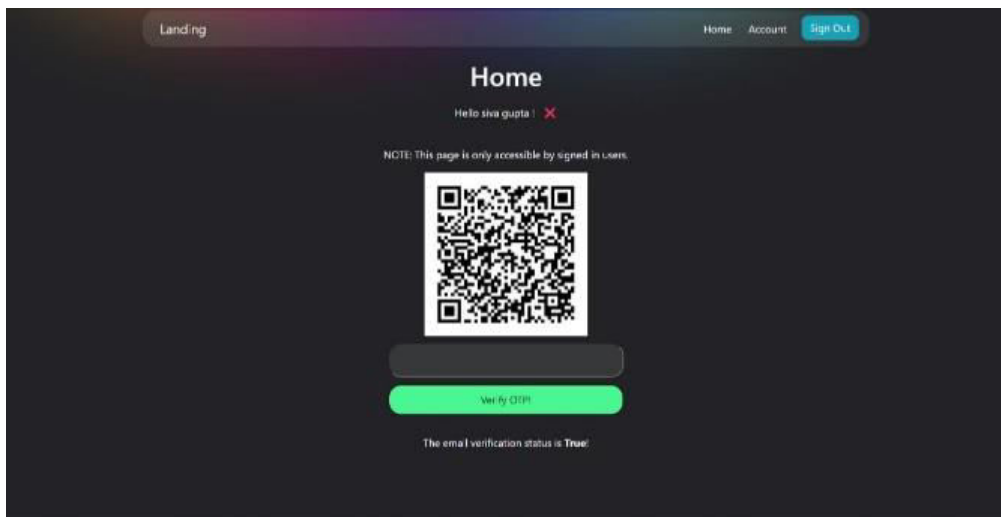
Hello,

Follow this link to verify your email address.

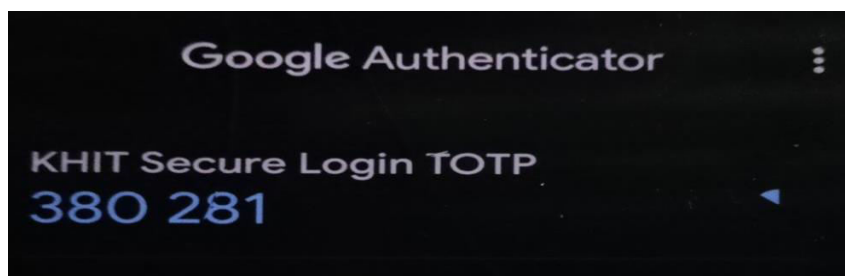
https://khit-secur-login.firebaseio.com/__/auth/action?mode=verifyEmail&oobCode=7gd8Ztm1QAhuush-pAVahG_8drvkNHWc3Lpt0TmKZNoAAAGGkbS06w&apiKey=AlzaSyCwYsQALhk8tbY-AU5Rzd7AitapqRxms-g&lang=en

Show quoted text

After successful verification or sign in the student will be displayed with the following QR code for joining the class.



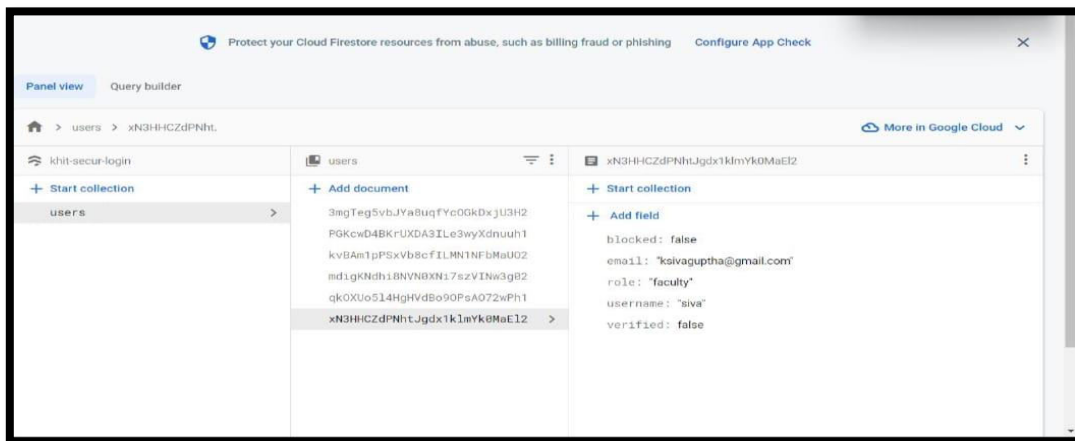
For every 30 seconds the unique ID will be changed for security purposes.



If the signed in person is a faculty then he will have access to another display of data as shown:

Full Name	Email	Verified	Blocked	Role
gowravkrish	jiljijiga1884@gmail.com	✗	<input type="checkbox"/>	student
Karnati Venkata Siva Gupta	ksivaguptha@gmail.com	✓	<input checked="" type="checkbox"/>	student
Gowrav Krishna Boyapati	Gowravkrishnaboyapati4@gmail.com	✓	<input type="checkbox"/>	student
admin	gowravkrishna143@gmail.com	✓	<input checked="" type="checkbox"/>	student

And this is how we are going to give access for admin and helps to take over the decision as per the situation.



And finally, the user can join the classes and can learn peacefully.



TEST CASE1: UNIT TESTING

Input: The user gives their credentials for signing in and joining the class

Output: If the user is authorised he/she will be redirected to the class

Result: The result is that the user is valid if his/her data is found in the database. Therefore, the test case1 is passed.

TEST CASE2: INTEGRATION TESTING

Input: The whole software will be tested here as the user gives valid and invalid details for joining the class.

Output: The user will join the class if the credentials are valid and if they are invalid, he will be eliminated from further process or will be allocated to the sign-up options.

Result: The result is that the database and the interface are well associated. Therefore, the test case2 is passed

TEST CASE3: USER INTERFACE TESTING

Input: The interface for both the students and faculty upon signing in the page will be tested.

Output: The student will be displayed with the interface of signing in and join the class. And the faculty will be displayed with the interface where the teacher can join the class and can have the data of the students.

Result: The result is that the interface is being displayed differently for both the student and the faculty.

5. CONCLUSION

Finally, we have built an application such that the faculty can teach in peace and the students can learn effectively. It has a different approach for joining the class, like using google authenticator, which improves security for our class and be able to prevent nuisance. Here we have made the application in such way that only the host can decide who can join the classes. And while signing up an email will also be sent to the user. This is to check whether the rightful owner of the email is the person that is trying to register or sign up for the classes. And the admin will have the controls for the role of a particular user. And all the data of the students and faculty will be stored in a database. Here we used firebase for storing the data base which will be accessed only by the host and admin. And our project will have more efficiency in improving security and having peaceful learning.

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