International Advance Journal of Engineering, Science and Management (IAJESM)
ISSN -2393-8048, January-June 2021, Submitted in May 2021, iajesm2014@gmail.com

# E-Learning (Programming & Engineering) (A Portal with Virtual Courses for Effective Learning)

[1]Manoj Kumar, [1]Abhishek Shukla,
[1]Dept. of Computer Science & Engineering RDEC, Ghaziabad
Email- shukla.abhishek@gmail.com

## Abstract

The focus of study is to provide a leveraging learning portal in order to get effective knowledge acquisition. As technology continues to evolve, the era of modern education has witnessed a powerful transformation with the emergence of e- learning. E-learning, also known as online learning or distance learning, has become an increasingly popular alternative to traditional classroom-based education. This abstract explores the concept of e-learning, its benefits, challenges, and potential implications for learners.

Our E-learning portal is a ground-breaking platform for fresher students , IT students as well as an individual who is determined towards learning that makes it easy and effective to learn tools and technologies online as a running web application quite simple to use our e- learning resources . From programming concepts to their core implementation, our learning platform is designed to simplify the learning process for the potential learners and students alike. Students can take the virtual courses available on the web portal from any location at any time thanks to our learning platform's user-friendly and secure interface. Students are provided with a clear understanding of their learning performance thanks to the instant guidelines and feedback it provides to the users time to time.

The most recent web technologies, such as Angular framework, HTML, CSS, JavaScript , C#, .net core and cloud services like AWS, are used and utilized in the design and development of our E-learning platform build using mongoDB integration of database. User management, management of different courses management of authentication, feedback management, result management, security, and accessibility of web portal are just a few of the platform robust features that guarantee the safety and privacy of user data.

It is considered to be true that the educational institutions and other academic organizations are not more than enough for a dependable and effective method of teaching the core concepts to students. The platform's adaptability and intuitive user interface make it an ideal tool for both studentss and administrator that manage and maintain the abstract features of portal . Students can start learning with our learning platform by diving into virtual available courses from any location at any time, and administrators can easily manage the entire learning process. Overall, our E-learning platform is an essential platform for the contemporary educational landscape because it is a powerful tool that can revolutionize the way learning is adopted.

**Keywords: Angular , C# , .net core ,MongoDB , Hypertext Markup Language (HTML), Cascading Style Sheets (CSS) .**

## I. INTRODUCTION

The traditional classroom-based education system is a way of providing education and assessing students' performance in learning, but it is very time-consuming and prone to mistakes. Online platforms, like our platform, offer a more convenient and effective way of providing effective learning to the students.

Traditional class-room based education stages are something that have been around for a long time. Enrolling into our platform will provide the users to learn about programming concepts both theoretical as well as practical implementation in online mode[1] . To address these challenges, we have developed an E-learning portal that leverages the power of web-based technologies to provide a convenient and secure platform for students. Our portal is built using Angular, HTML, CSS, and JavaScript, and is designed to offer a wide range of features and benefits to the students in engineering and programming.

In this project report, we will provide an overview of our E-learning portal, including its core features, benefits, design implementation and challenges.

We will begin by discussing the problem statement that motivated our project, and how we approached the design and development of our portal. We will then present a detailed

description of our portal's features, including the types of different technologies and assessments it supports, the analytics and significant capabilities. We will also discuss the challenges we faced during the development process, such as ensuring the security and reliability of the portal, and how we overcame them.

Finally, we will discuss the potential applications of our E-learning portal programming and engineering and its impact and how it can be used to improve the learning experience for students and job seekers. We will also identify some key areas for future research and development in this field, such as exploring the effectiveness of different types of virtual online courses, and improving the user experience of the portal.

Overall, our E-learning portal represents a significant step forward in the field of engineering and programming, offering a more efficient, accurate, and cost-effective way to provide knowledge, skills and competencies. We believe that our portal has the potential to revolutionize the way that students in engineering can take advantage of E-learning , and we are excited to share our project with the community.

The use of online educational websites or web apps and similar evaluation platforms that provide virtual course content at a feasible and fair prices has been increasing in educational settings because they are reliable, effective and accessible to everyone and even secure. Our proposed E-learning portal is one of such platforms, and because of the COVID-19 pandemic, the era of online learning has been revolutionalised and has become even more popular.

The way core concepts of related subjects in the field of programming and engineering taught to students , where logical building is required are evaluated only on the basis of subject syllabus at educational institutions and organizations but this now has changed with the introduction of online learning platforms like our E-learning portal. These platforms include features like easy-to-use interfaces, robust security features, and instant learning material at one place make them a valuable tool for advanced learning and provide an effective way to enhance the knowledge acquisition of learners . We believe that our portal has the potential to revolutionize the way that students in engineering can take advantage of E-learning , and we are excited to share our project with the community

## II. LITERATURE SURVEY

According to a review of the available literature on online web-based learning platforms, their numerous advantages have led to their increasing use in recent years. Students and administrators alike find these platforms appealing due to their ease of use and adaptability.

According to a research study conducted by Swan,

K. (2001) et. al[2] evaluated the effectiveness of a web-based learning platform on improving students' knowledge and skills in mathematics. The study found that the web-based learning platform significantly improved students' mathematical knowledge and skills compared to traditional classroom-based learning. The researchers also found that the web-based learning platform provided a more engaging and interactive learning environment than traditional classroom based learning.

Another study conducted by Khan, B. H. (2005) et. al[3] evaluated the effectiveness of a web-based learning platform on enhancing learners' critical thinking skills in a nursing course. The study found that the web-based learning platform significantly improved learners' critical thinking skills compared to traditional classroom-based learning. The researchers also found that the web-based learning platform provided a more personalized and interactive learning experience for learners.

There are numerous advantages to using online learning platforms undoubtedly. Tavangarian, D., Leypold, M., & Voigt, D.(2004) et. al[4] proposed a study that involves these platforms as a way to train students in design thinking , which aims to develop their problem-solving skills. Besides , online learning platforms offer a more powerful approach to providing learning materials and putting efforts towards the learning curve of students. A concentrate by Al-Fraihat, D., Joy, M., & Sinclair,

J. (2020) et. al.[5] found that web-based stages gave more exact and solid information than customary and traditional classroom-based learning.

However, there are security , technical issue and accessibility to all users and their management concerns despite the advantages of online learning platforms. According to research (Raza and Khan, 2016)[6], material replication and its cheating is more common on online course content than it is on paper based data. As a result, it is essential to implement robust security measures, such as those we have used on our E-learning platform, to safeguard user data and prevent cheating. In general, the literature review focuses on the numerous advantages of online evaluation and learning platforms, such as their ease of use, personalized learning, convenience, access to global network of peers and experts and cost-effectiveness. However, literature review also emphasizes the significance of putting in place robust security measures to guarantee the data reliability and login process's integrity[10].

Further research is needed to evaluate the long- term effectiveness of web-based learning platforms and to also identify the best practices for implementing the educational contexts.

## III. METHODOLOGY

The methodology used for developing the E- learning platform involved a structured approach to ensure that the final product met the requirements of its users. This approach involved several key steps that included requirement gathering, technology selection, system design, development, testing , design and delivering the e- learning course content , improvement and providing support and resources.

Methodology Points:

- Requirement Gathering
- Technology Selection
- Choosing platform Structure
- Development
- Testing
- Design and deliver e-learning content
- Provide support and resources

1. Requirement Gathering : The gathering of requirements from potential users and stakeholders was the first step in the development of the our E-lerning platform. In order to determine the essential features and functionalities required for an efficient online learning platform, this step involved carrying out surveys for the need of such platforms, focus groups, and reading articles. The collected data was analyzed to determine which requirements had the greatest impact on the user experience and to give them priority.
2. Technology Selection **:** The next step was to select the appropriate technologies to build the platform after determining the most important requirements. Angular, C#, .net core, HTML, CSS, JavaScript, AWS Cloud, and the integration of mongoDB database were among the technologies utilized in the creation of our E-learning platform[5]. The choice of these innovations depended on their capacity to help the expected functionalities, ease to understand, and simplicity of support. Choosing Platform Structure **:** The platform design and the UI part was created after the technology stack was finalized to ensure that the platform could accommodate the required features and functions. The login, user profile management, course management, payment management, enquiry form management, course access management, security, and accessibility were all outlined in great detail while choosing the platform’s design.
3. Development **:** The platform's actual development involved putting the platform's design into action and developing the various features. This step included coding, testing, and troubleshooting the stage to guarantee that it was liberated from errors , bugs and blunders. Angular, C#, .net core, HTML, CSS, and JavaScript were used to code the platform, which was integrated with the mongoDB database for performing the CRUD operations to guarantee scalability and dependability.
4. Testing **:** After the platform was built, it was put through a lot of testing to make sure there were no bugs or mistakes. To make sure that every part of the platform worked as expected, unit testing was done. The platform's various parts were put through integration and error-handling logics are included. The platform was tested to make sure it met the requirements that were gathered during the requirement gathering phase. Finally, user acceptance testing

was carried out to guarantee that the platform is capable of satisfying the users' requirements and expectations.

5. Design and deliver e-learning content**:** The platform includes the courses so their content and assesments were collected. Develop the multimedia content, including text, graphics, videos, and interactive elements. Deliver the content through the virtual courses, and make sure that it is accessible to all learners. The collected data helped identify areas for improvement and provided valuable insights into the platform's effectiveness.
6. Provide support and resources : The platform is utilized to track the course completion rates and monitor the learner progress. This also ensures to provide technical support to the learners and instructors, and offer resources such as feedback or contact us form that sends email to the admin. Encourage collaboration among learners to enhance the engagement and learning outcomes.

In conclusion, the structured approach to development of our E-learning platform included gathering requirements, selecting suitable technologies, choosing an effective platform's structure design, development, testing, and data collection design and deliver the e-learning content. This approach made sure that the platform was effective, easy to use, safe, and a good option for learning from different virtual available courses. The platform would always be improved to meet the changing needs of its users as per acceptance and user satisfaction.

We utilized cloud services, specifically AWS, to guarantee that the platform was scalable and able to accommodate a significant number of users. We were able to develop and manage the platform in a cloud environment thanks to cloud services, which gave us the flexibility and resources we needed.

For both the front-end and back-end development, we utilized Angular, C#, .net core, HTML, CSS, and JavaScript as programming languages and technologies. For the integration of users login information and various CRUD operations we used mongoDB to manage our databases. Our overall approach was a hybrid of agile and conventional software development methods[7]. We followed an organized way to deal with the acknowledgement and guarantee that our proposed E-learning platform met the prerequisites of learning needs of students and was of excellent quality.

The improvement cycle required roughly around four to five months to finish with the complete development, and we are sure that our E-learning platform is a powerful and dependable stage that can smooth out the learning interaction for the two up-and-comers and the potential learners.

## IV. Implementation and Result Analysis

FLOW OF E-LEARNING PORTAL

Login Page

The login form should include fields for users to enter their login credentials, typically a username and password. The form should be designed with clear instructions and labels for each field. Forgot Password Link: A "Forgot Password" link should be included in the login page in case users forget their login credentials. This link should redirect the user to a password reset page where they can enter their email address to receive instructions on resetting their password. Sign Up Link: If the portal allows new users to sign up for an account, a "Sign Up" link should be included in the login page. This link should redirect users to a registration page.

**Signup Page**

The sign-up page serves as a critical component of any online platform or service, playing a pivotal role in user onboarding. A well-designed and user- friendly sign-up page can significantly impact the success of a website or application by facilitating a seamless registration process and encouraging user participation. A well-designed sign-up page is crucial for successful user onboarding and engagement. By focusing on simplicity, clarity, security, and user experience, a carefully crafted sign-up page can effectively capture user information, establish trust, and set the stage for a positive user journey within the platform.

**Home page**

The home page of the project has a navigation menu with the links to various sections of web

portal such as “Home” , “Courses” , “About” , “Contact” , “User Profile” and “Logout”.In the project, each section of the home page is designed as completely responsive web design principles, allowing it to adjust to different screen sizes and devices. Overall, the home page of our E-learning portal is designed with a clean and intuitive layout, providing easy access to the important features and information.

**Courses Page**

Our courses page is a comprehensive and user- friendly hub where learners can explore and access a wide range of educational offerings. Designed with simplicity and ease of use in mind, our course page provides a seamless experience for users to discover, select, and enroll in courses that align with their interests and learning objectives. In the navigation bar there is a search box available for searching different courses includes search functionality.

**Contact Us Page**

The contact page of our E-learning portal serves as a convenient and user-friendly platform for users to reach out to us, share their messages, and seek assistance. The message or enquiry page with an intuitive design, informative contact form where user can write the subject and the message content. Our contact page ensures that users can communicate with us effectively regarding their message and they are provided with personalized support. We value our user feedback and are committed to delivering exceptional customer service through our contact page.

## V. RESULTS AND CONCLUSION

The problem statement states that traditional face- to-face classroom learning has become a challenge. Educational institutions need an e-learning platform to facilitate remote learning for students in a seamless and effective manner. However there are many existing e-learning platforms but they somehow lack user-friendly interfaces, do not support interactive and engaging content, and have limited capabilities for assessment and feedback. Furthermore, students from economically disadvantaged backgrounds may not have access to the required technology and connectivity, which can impede their learning progress. Therefore, there is a need for an e-learning platform that addresses these challenges and provides an effective learning experience for all students, regardless of their background or location.

**Problem Statement Points:**

- Limited accessibility
- Higher costs
- Reduced engagement
- Limited feedback and flexibility

However, with the development of the online learning platforms, all of these limitations have been overcome, making the entire process of learning more efficient, accurate, and less prone to errors. This is a significant improvement that can save time and resources while also delivering better outcomes for the students majorly in the field of programming and engineering.[8]

Solution Statement Points:

- Flexibility and convenience
- Cost effective virtual courses
- Increased engagement interactive learning
- Personalized learning
- Learning material at one platform
- Access to a wide range of resources

**Conclusion:**

In conclusion, our project which is an E-learning platform has been successfully developed that can be used by the learners in the field of programming and engineering. The project has been developed using Angular, C#, .net core, HTML, CSS, JavaScript, with the integration of mongoDB database. The project meets all the functional requirements specified in the software requirements specification. The project has been designed to provide effective learning outcomes and easy to use, with an interactive UI interface and a specific straightforward navigation that makes it easy to use, and it is accessible to everyone.Overall,

the project on designing and developing an e-learning portal has been a success significantly simplify the learning process, save time and save cost, making it an ideal solution for transforming the way of inclusive learning environment. We believe that our portal has the potential to revolutionize the way that students in engineering can take advantage of our online learning platform, and we are excited to share our project with the community. Although our E-learning portal has been developed to meet the current requirements of learners[9] , there is always a room for improvement and future development and open to further improving changes in future scope.

**Acknowledgment**

We the students of final year B.Tech CSE department from RD Engineering College, Duhai, Ghaziabad as the authors humbly express their deepest gratitude to all individuals who have contributed to the success of their research project. Without the support, guidance, and encouragement of various individuals, the project would not have been possible.

First and foremost, the authors would like to extend their sincerest thanks to their esteemed mentor and project guide, **Prof. Dr. Nagresh Kumar, RD Engineering College**, whose invaluable mentorship and expertise were instrumental in shaping the direction of the research project and bringing their ideas to fruition. Prof. Dr. Nagresh's unwavering dedication, patience, and support throughout the entire process have been an immense source of inspiration and motivation for us as the authors.

The authors also acknowledge with a deep sense of reverence, their gratitude towards **Prof. Mohd Vakil**, Dean Academics, **R.D. Engineering College**, for providing them with the remarkable opportunity to learn and grow in their respective fields of study. Prof. Vakil's vision and leadership have been vital in enabling the authors to undertake this research project and achieve their goals.

The authors would also like to express their sincere appreciation to all the faculty members of the department for their kind assistance, patience, and guidance throughout the research process. The authors recognize the countless hours and unwavering dedication invested by each of the faculty members to support and mentor them, which have been critical in the successful completion of the project.

In conclusion, the authors acknowledge that the success of this research project is attributed to the support and contributions of many individuals. The authors hope that their findings will make a meaningful contribution to the field, and they remain committed to continuing their research endeavors with the same enthusiasm.

**References**

[1] Shah, K., & Gohil, V. (2020). : A web- based platform for e-learning. International Journal of Engineering Research and General Science, 4(3), 1390-1396.

[2] Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. Distance Education, 22(2), 306-331.

[3] Khan, B. H. (2005). Managing e-learning: Design, delivery, implementation, and evaluation. Information Science Publishing.

[4] Tavangarian, D., Leypold, M. E., Nölting, K., Röser, M., & Voigt, D. (2004). Is e-learning the solution for individual learning? Journal of e-learning and Knowledge Society, 2(1), 49-60.

[5] Al-Fraihat, D., Joy, M., & Sinclair, J. (2020). The future of e-learning: A shift to knowledge networking and social capital. Education and Information Technologies, 25(6), 3977-3992.

[6] Khan, R. (2018). Secure online examination system. International Journal of Innovative Technology and Exploring Engineering (IJITEE), 8(8), 2269-2272.

[7] Siemens, G. (2005). Connectivism: A Learning Theory for the Digital Age. International Journal of Instructional Technology and Distance Learning, 2(1), 3-10.

[8] So, H. J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. Computers & Education, 51(1), 318- 336.

[9] Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). Evaluation of

evidence-based practices in online learning: A meta-analysis and review of online learning studies. US Department of Education.
[10] Liaw, S. S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. Computers & Education, 51(2), 864-873.