Creating an Interactive Intelligent Tutoring System to Maintain and Enhance Students' Attention

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Abstract— In the internet environment that we often encounter today, learning platforms provide convenience to people. The e-learning model is used wherever there is a need for learning and teaching. Especially the covid-19 pandemic period we are in has shown us how necessary e-learning platforms are. This study is an e-learning platform similar to Udemy and W3schools, which is now widely used today. The platform enables the student to learn the C programming language effectively by providing c programming lectures, exercises to improve the learned knowledge, sample questions and solutions, and additional information. Even people who have no knowledge of programming with the e-learning platform can achieve their learning by following an easy and effective path.

Keywords— Interactive Tutoring System; E-learning; Maintain Attention; Enhance Attention.

1. INTRODUCTION

Nowadays many developed countries have entered the Information Society stage, and the importance of education has been better understood in order to maintain sustainable growth. Many developed countries have greatly increased their education expenditures in order to develop their human capital and thus to grow rapidly[1,2]. However, advances in general-purpose technologies called information and communication technologies that allow information to flow easily, quickly and at low cost, although it offers completely new opportunities for educational institutions and those who want to study, it has started to have quite a big impact on the education sector[3].

One of the most important effects that information and communication technologies covering the internet have revealed in educational activities is e-learning, which is a new way of learning conducted over computer networks and the internet. In our age of intensive use of information technologies, knowledge accumulation is constantly increasing. With the effect of globalization, the circulation of information in the world has increased, and technologies for making the most use of this information and obtaining this information have been developed. Individuals have gained new opportunities with e-learning, which offers a flexible, rich and interactive structure. Due to its features such as providing education to people who live in different places, who cannot continue formal education, no time and space restrictions, e-learning is rapidly becoming widespread all over the world.[4-7]

2. MATERIAL AND METHODS

2.1 System Architecture

The operation of this system is shown in Figure 1. The system consists of web application interface. Volunteering users can access the e-learning system at "wols.site" web address. The user logs in from the student login page is redirected to the student homepage, the navigation bar on the home page contains links for the student's easy access to courses, exercises, and examples. Users can also provide direct access to communication and user profile. They can also see instant notifications from the teacher here. Figure 2 shows the system framework, this framework adapted from previous the studies such as [9-13]

A website management panel has been created to manage the e-learning Web application (WOLS). Web site management panel it is designed to update the site and allows you to manage the content of the areas specified by the programmer. System administrators can perform course add, delete and exercise add, delete operations from the administration panel. Also system administrators can view students ' achievement ranking from the admin panel, depending on the results of the exercises. These functions were realized by connecting the management panel to the database and coding with PHP, JavaScript and MySQL.
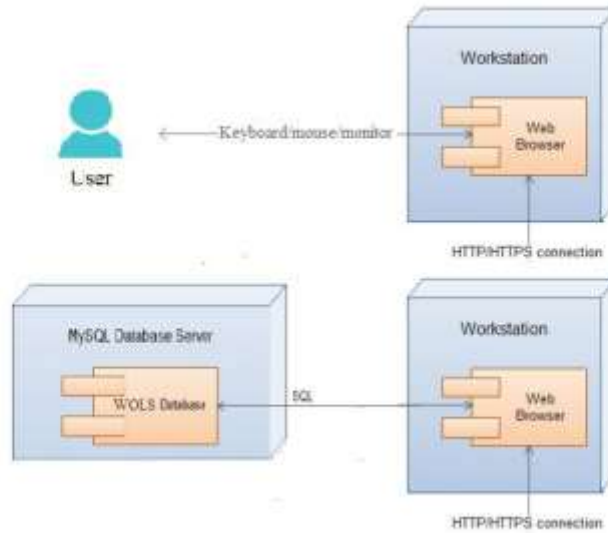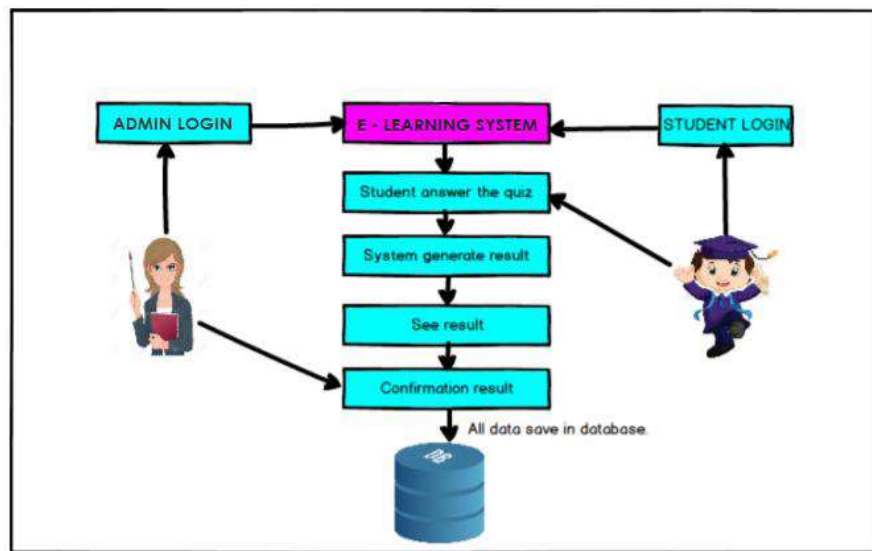
Fig.1 *System Architecture [8]*

Fig.2 *System framework.*

2.2 Web Application (WOLS)

The definition of WOLS is a Web-Based Online Learning System. The web interface of e-learning system is prepared with PHP, JavaScript web programming language. Figure 2, also shows the framework structure of the e-learning web application. A framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful.

As shown in Figure 3 and 4, the data received with JavaScript is sent to the database when the admin user enters the data and clicks on the save button. Admin can add exercise and question details from this part of the management panel.
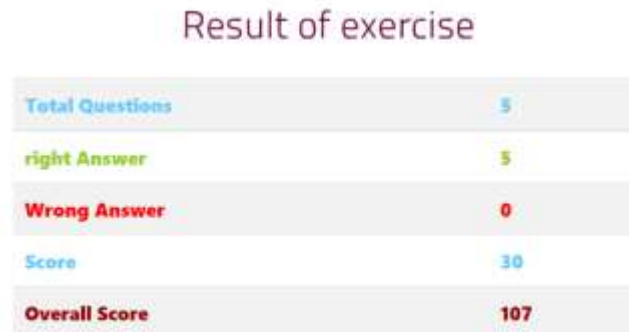
Fig.3 *Add exercise screen.*

Fig.4 *Add question details screen.*

The screen that the administrator can view after entry are given in Figures 5.

Fig.5 *Display the added exercises.*

After each exercise, the correct and incorrect answers given by the student to the questions are calculated and reflected in a table on the screen. The structure of the score table is shown in Figure 6.

Fig.6 *Display score table.*

Course content is prepared separately for each subject of the C programming language. These contents have both verbal and visual content (screen output of codes). Content was created in the same way in the examples section on the home page. Figure 7, shows a screen image from the ranking section of the management panel. The ranking here constantly changes depending on students ' achievements in exercises. In this way, the teacher follows the success of his students.

Fig.7 *Displaying students' achievement ranking.*

3. CONCLUSIONS

We see that the concepts of education and training have changed in parallel with the changes in the process from the past to the present. All technologies used in the transmission and sharing of information are also widely used in educational and training processes. E-learning is a part of the concept of distant training. Therefore, before defining the concept of e-learning, it would be useful to define the concept of distance education. Distance education is a corporate educational activity in which students, teachers and teaching materials in different places are brought together through communication Technologies. Remote training with a different expression, with different formats in different environments, there is more than one teacher or not, different educational organizations at different learning levels and ages, different technologies, different teaching methods and different philosophical approaches and a strategic motivation can be achieved. E-Learning, Internet/Intranet (Local Area Network) or over a computer network, the individual's self-learning and the diffusion of actual knowledge of time, place does not recognize the border, or spouse to communicate with other learners and those who can teach as simultaneously untimely that provides visual and auditory responses that can interact with computer technology, socio-economic status of the rule that eliminates the barriers of lifelong education that provides individuals the opportunity to benefit from learning method. Based on this, an e-learning web application has been designed for all students who want to learn the C language. Many parts, including exercises and examples, have enabled students to reinforce what they have learned and thus identify the parts they are missing. By designing an appropriate management panel for teachers, was created. In this way, an e-learning web application has been created that students and teachers can easily use and interact with.

4. REFERENCES

[1] Bruscato, A.M. and Baptista, J., (2021a). Teaching Modalities in Brazilian and Portuguese Universities: A Case Study on the Perception of Students and Professors in Times of Covid-19. Revista Brasileira de Educação, 26.

[2] Bruscato, A.M. and Baptista, J., (2021b). Synchronous and asynchronous distance learning of anaphora in foreign languages: an experimental study. Texto Livre: Linguagem e Tecnologia, 1-18.

[3] Ramaha, N.T., Basha, A.D., Ismail, W.M.F.W., Umer, I.N., (2015). Students' Motivation Is "Realistic Challenge": Online Courses. International journal of scientific & engineering research, 6(6), 1383-1386.

[4] Bokhari, M. U., & Ahmad, S. (2013, September). Design for interactive e-learning based upon multi-agent system: I-MBLS. In Confluence 2013: The Next Generation Information Technology Summit (4th International Conference) (pp. 456-460). IET.

[5] Ramaha, N.T.A. and Karas, I.R. (2021). Maintain Learners' Motivation within Asynchronous E-Learning Environments: How Can Interactive Avatars Help?. European Journal of Advances in Engineering and Technology, 8(9), 9-14.

[6] Brusilovsky, P. (1999). Adaptive and intelligent technologies for web-based eduction. Künstliche Intelligenz, 13(4), 19-25.

[7] Elgamal, A. F., Abas, H. A., & Baladoh, E. S. (2013). An interactive e-learning system for improving web programming skills. Education and Information Technologies, 18(1), 29-46.

[8] Ramaha, N. T. (2017). Extraction, Validation, and Evaluation of Motivational Tactics Rules in a Web-Based Intelligent Tutoring System (WITS) (Doctoral dissertation, Universiti Sains Malaysia.

[9] Alseelawi, N. S., Adnan, E. K., Hazim, H. T., Alrikabi, H., & Nasser, K. (2020). Design and implementation of an e-learning platform using N-TIER architecture.

[10] Bulut Özek, M., Akpolat, Z. H., & Orhan, A. (2013). A web-based intelligent tutoring system for a basic control course. Computer Applications in Engineering Education, 21(3), 561-571.

[11] Grivokostopoulou, F., Perikos, I., & Hatzilygeroudis, I. (2017). An educational system for learning search algorithms and automatically assessing student performance. International Journal of Artificial Intelligence in Education, 27(1), 207-240.

[12] Hendradi, P., Abd Ghani, M. K., Mahfuzah, S. N., Yudatama, U., Prabowo, N. A., & Widyanto, R. A. (2020). Artificial Intelligence Influence In Education 4.0 To Architecture Cloud Based E-Learning System. International Journal of Artificial Intelligence Research, 4(1), 30-38.

[13] Hershkovitz, A., & Nachmias, R. (2008). Developing a log-based motivation measuring tool. Paper presented at the EDM.