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Virtual technology for smart education

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***Abstract*---**In the current situation it is very difficult to provide scientific education to children. Older methods used up to this point, such as board and chalk, are not showing interest in children. Accordingly, new educational approaches have been developed that incorporate new approaches and technology. As part of that, the virtual laboratory approach was incorporated into the new curriculum. In it children can learn technological development in a real environment. It can also develop practical knowledge for children. Developing such practical knowledge means buying the equipment you need which is very costly. The approach is useful to provide these at a low cost. In this process, even if the tools are not actually available, you can make them on a computer and learn their uses. This paper mainly focus on the virtual technologies involved in the implementation of labs on virtual environment and development towards smart education period.

***Keywords*---**virual lab, smart technology, smart education.

Introduction

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Education has always been the center of development for any society. The way of life and learning of the people regardless of the times and civilization has taken place as a result of the structure of Education. Indian society is considered to be about 69 percent of its population under the age of 35 which clearly indicates that such a large number of people are considered to be new to education or are in the process of transitioning and adding new skills to their existing sets. It is not just what we learn on our way to school. As long as we go to school and go to college and graduate. We read a lot but we may not read. The more we learn as we grow fully from our environment, the more we grow. What we learn, the way we are taught those things and the way we apply what we learn is what should be involved in a good education system. new teaching methods. But when the epidemic hit teachers they had to forcibly move away from online teaching methods so that students' learning process could not stop. Nearly 20 years ago the concept of e-Learning was very new to people and they were not yet ready to accept change or embrace change from the traditional digital teaching and learning approach . Nearly 20 years ago the concept of e-Learning was very new to people and they were not yet ready to accept change or embrace change from the traditional digital teaching and learning approach. But in the last 5-7 years and especially in the covid-19 era many people have switched to digital reading. Now digital education is not just 12-kg but also educational for college students, higher education and work. professionals who plan to continue to hone their reading skills and gain knowledge.

The expansion of the World Wide Web (WWW) and the maturity of the Internet and your promotion of both network infrastructure and electronic communication create all the conditions necessary for the adoption of this powerful communication system for access purposes. in the field of technology, Virtual Reality (VR) technology has been widely proposed and recognized as a major technological advancement to support lifelong learning for individuals and adaptable workers. One of the unique capabilities of VR technology is the successful rendering of visually impaired concepts at featured events and the opportunity for interaction with users, which in real life can be limited by distance, time and security features1. The expanded activities that Virtual Environment can offer, combined with the growing interest in distance learning have led to the creation of a wide range of applications that embrace Virtual Reality technology to support the learning process and the creation of such a program called Educational Virtual. Nature. However, in addition to the technical features that embrace Virtual Reality, the word "educational" sends a number of problems, e.g. access to learning content and educational model that should be used to fully realize the learning process. One of the most developing trends in this guide is experimental learning or "experiential learning" where users are encountered as actors and not as inexperienced recipients of the information provided. Exploratory learning involves a high level of user interaction with both other users and objects located in the physical environment. such a Virtual Radio pharmacy Laboratory, built on the framework of the VirRAD IST project, will be presented in the next phase. In addition, another example of a distributed real-world learning environment based on the imitation of C-VISions. C-VISions is a research project, focusing on the use of a multi-user 3D environment for educational purposes. For the learning process to take place, users are represented by avatars in the 3D1 environment.

The evolution noted in Information and Communication Technologies also affected Greece, both in the industrial and educational sectors. With regard to the field of education, it should be noted that over the past decade most high schools have been equipped with computer laboratories to acquaint students with the new knowledge and technology community. In addition, an internal communication network has been established for all schools, which allows for individual communication and collaboration in the field of higher education. However, the education system has not yet fully utilized the additional skills that a school computer lab can provide Science is a subject related to laboratory activities. It is information on natural phenomena that include interrogation and manual detection as well as exploration under the teacher's audience [1]. In the proceeds of science, laboratory work is as important as giving students the opportunity to make a variety of handicrafts [2]. Laboratory activities are expected to help students acquire technical skills. Through assessment activities, students will gain accurate knowledge, conceptual understanding, and long-term memory. in addition, current experiments can be performed using advances in the field of information technology [3].

The development of digital age technology offers a variety of positive effects in support of his success in the science learning process. information technology can be used as an alternative to simplify the needs of collaborative laboratories in schools. Another contribution to the development of the digital age that can be used in the field of education is the visual laboratory. The visual laboratory provides exciting laboratory and simulation tools, ease of use of tools, and extremely accurate results [4]. Visual Lab is a learning curve that can provide direct visual demonstration, visual interactive space, virtual reality testing, and performing experiments very effectively. Through visual laboratory work, students have the opportunity to repeat the negative test and deepen self-awareness [5 - 6]. n practice, visual labs offer a variety of benefits in achieving the expected learning outcomes. The use of virtual laboratories addresses some of the problems encountered in traditional laboratories and has a positive impact on achieving learning objectives [3]. Visual labs provide cost-effective, highly secure, and widely used learning capabilities [7].

Although virtual labs cannot replace traditional laboratories, the use of virtual labs greatly aids the scientific learning process. However, the development of computer hardware and software enables teachers to incorporate visual technology into future teaching strategies [8]. The virtual laboratory uses computer models, simulations, and various other teaching technologies to replace standard laboratory operations [9-10]. It offers many benefits. It is done online so that testing does not harm yourself or others. Affordable imitation costs, once upgraded, the tool can be used over and over again at no additional cost. The virtual lab allows students to work independently or collaboratively regardless of school labs, chemicals, and materials available. Therefore, this study aims to determine the impact of the use of visual laboratory learning on students' thinking, skills, and scientific attitudes.

Literature Survey

This literature survey gave us an idea about expansion of the World Wide Web (WWW) and the maturity of the Internet and your promotion of both network infrastructure and electronic communication create all the conditions necessary for the adoption of this powerful communication system for access purposes. In the field of technology, Virtual Reality (VR) technology has been widely proposed and recognized as a major technological advancement to support the lifelong learning of individuals and adaptable staff. One of the unique capabilities of VR technology is the successful translation of visually impaired ideas into featured events and the opportunity to interact with users, in real life that can be limited by distance, time and security features1.

The expanded activities that the Virtual Environment can offer, combined with the growing interest in distance learning have led to the creation of many different programs including Virtual Reality technology to support the learning process and create such a program called Educational Virtual. Nature. However, in addition to the technical features that embrace Virtual Reality, the word "educational" conveys many problems, e.g. access to learning content and educational model to be used to fully implement the learning process.[11][12] One of the most developing trends in this guide is experimental reading or "experiential learning" where users are encountered as actors and not as inexperienced recipients of the information provided. Exploratory learning involves a high level of user interaction with other users as well as features found in the physical environment.

The Virtual Radio pharmacy laboratory, built on the framework of the VirRAD IST project, will be introduced in the next phase. In addition, another example of a real-world learning environment that is distributed based on the imitation of C-VISions. C-VISions is a research project, focusing on the use of a multi-user 3D environment for educational purposes. For the learning process to take place, users are represented by avatars in the 3D1 environment.

Evolution marked by Information and Communication Technologies also affected Greece, both in the industrial and educational spheres. With regard to the education sector, it should be noted that over the past decade many high schools have been equipped with computer laboratories to acquaint students with new knowledge and the technology community. In addition, an internal communication network has been established for all schools, which allows for individual communication and collaboration in the field of higher education. However, the education system has not yet fully utilized the additional computer labs that a school computer can offer Science is a subject related to laboratory activities. Natural event information that includes investigations and personal findings and evaluations under the teacher's audience [13][14]. For scientific income, laboratory work is just as important as giving students the opportunity to do a variety of handicrafts [15]. Laboratory activities are expected to help students acquire technical skills. Through assessment activities, students will gain accurate knowledge, conceptual understanding, and long-term memory. in addition, current experiments can be performed using advances in the field of information technology [16].

The advancement of digital age technology offers a variety of positive results in support of his success in the science learning process. information technology can be used as an alternative to simplify the needs of collaborative laboratories in schools. Another contribution to the development of the digital age that can be used in the field of education is the visual laboratory. The visual laboratory provides exciting laboratory and simulation tools, easy-to-use tools, and extremely accurate results [17]. Visual Lab is a learning curve that can provide precise visual cues, virtual interactive space, virtual virtual reality testing, and perform tests with great efficiency. Through visible laboratory work, students have the opportunity to repeat negative tests and deepen their self-esteem [18][19]. n practice, visual labs offer various benefits in achieving the expected learning outcomes. The use of virtual laboratories addresses some of the problems encountered in traditional laboratories and has a positive impact on achieving learning objectives [20]. Visual labs provide affordable, highly secure, and widely used reading capabilities [21].

Although virtual labs cannot replace traditional laboratories, the use of virtual labs greatly aids the scientific learning process. However, the development of computer hardware and software enables teachers to incorporate practical technology into future teaching strategies [8]. The virtual laboratory uses computer models, simulations, and various other teaching technologies to replace conventional laboratory functions [5]. It offers many benefits. It is done online so that testing does not harm yourself or others. Affordable imitation costs, once upgraded, the tool can be used over and over again at no additional cost.

The current system is the default. Therefore all Student information, courses and intellectual property details are kept in a file. In Faculty, they have a variety of files for different purposes, such as a separate student profile file, presence and a separate report file etc. For the Student, they have different notebooks for different subjects; sometimes they forget something during study.This Classroom Program is available anytime without any limit which means we can reach 24 hours a day. Although the use of the lab in student learning plays a very important role in scientific education. has some limitations as well problems, especially in developing countries. India is also one of the developing countries so India is also facing a similar situation with machines, laboratory activities are expensive. With planning and implementation, it takes a lot of time to assess student performance during activities can be difficult in very crowded classrooms. Lack of lab or equipment, or insufficient lab conditions that limit the teacher to perform simple laboratory tasks. In addition they also overcome potential risks that can be seen in real-world laboratory conditions (Yenitepe, 2001). For example a dangerous human health test is prepared on a computer as simulations, so that students can see the design of the test and do research on the computer and see the result. Without taking dangerous, difficult or impossible tests,imitation has benefits from time, safety, cost and visual inspirational value (Rodrigues, 1997; Tekdal, 2002).

The virtual lab allows students to work independently or collaboratively regardless of school labs, chemicals, and materials. Therefore, this study aims to determine the impact of the application of visual laboratory studies on students' thinking, skills, and attitudes in science.

Figure 1: IOT based smart class

Effective in learning about software tools such as digital resources, messaging, social networking, virtualization and hardware tools namely interactive white board, smart table, tablet and e-bag etc. It helps students to learn anywhere and anytime. This approach enhances the learning of learner s capacity, knowledge and motivates the reader satisfactorily and explicitly with digital resources. Improves their personal knowledge through gadgets and system resources. This will allow analysts to develop a new approach and learn.

Methodology

The main design idea of the system is to use the World Wide Web as communication structure and a Web browser as user interface. The Web browser provides a platform for transmitting information as well as an environment to run Java applets. The Web itself provides the infrastructure to exchange the necessary information. the overall framework of virtual lab. On server side there is the one hardware experiment kit present for performing the hardware program. And which is connected to the server via wireless connection. For wireless connection we use zigbee module because it contain max signal rate(250 Kb/s) with low cost. And User devices is connected with centralize unit via weird/wireless connection. Using the virtual lab we can perform both hardware and software program very easily. In hardware program we can perform embedded program very easily. In traditional lab we face so many problems like Not User Friendly, Not Useful for E Learning Student, Lots of paperwork, Time consuming. So this problem can be solved by virtual lab we can overcome this problem by using virtual lab. Therefore, use of VR in labs, in other word, use of virtual lab or simulation programs, overcomes some of the problems faced in traditional laboratory applications and make positive contributions in reaching the objectives of an educational system.

Figure 2: Virtual lab frame work

In virtual lab we can perform and uses GUIs to implement several interactive exercises, giving students practical experience of important theoretical aspects of multimedia processing. The main objective of this Virtual Lab is to immerse the student in the related theoretical topics, starting with very fundamental concepts and progressively and hierarchically building up his/her Knowledge to the level of current state-of-the-art approaches. The MASTERS Virtual Lab is intended to be of use both to tutors giving in-class demonstrations and to students studying at home and performing laboratory practical's [3]. In-class demonstrations using the interactive MASTERS' GUIs can complement lectures, offering an immediate visual interpretation of the concepts discussed.

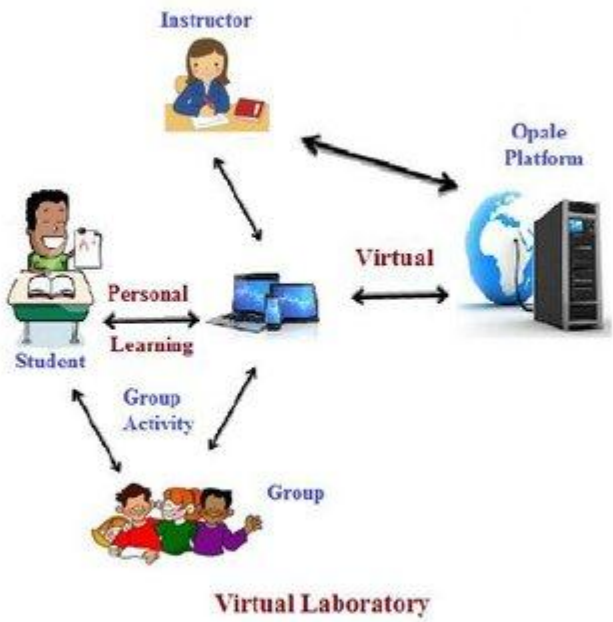

Figure3:virtual lab design

The MASTERS Virtual Lab is accompanied by a detailed manual that provides an essential summary of the theoretical concepts behind each experiment, describes the structure and functionality of each GUI, and provides a set of unworked exercises that can be used as homework assignments.

Results and Discussions

In various studies in recent years have discussed the benefits of virtual laboratories. Topics updated especially discuss the benefits of student-based or comprehensive lab-based learning. Problems that exist in general learning areas need to be addressed using unconventional efforts. There should be a reading strategy that will encourage it students to be diligent. Virtual Labs will go a long way in improving learning in the arts, especially in the field of practical learning. Use of virtual laboratories in management and use relationships and the achievement of learning outcomes. Visual laboratories offer many features that can be improved to support more effective and efficient learning. The role of the teacher in learning Virtual Labs has a huge role to play in this understand the characteristics of learners, so learning is possible in a comfortable and balanced way. Especially in the distance educational process, so that students do not have a lack of real research that does not allow students to fully drive opt practical skills, physical learning, and expertise of assessment methods to deal with the era of industrial change.

Conclusion

Virtual lab have been presented an innovative solution to developing and enhancing lab practice and access for distance learners, and as a means of providing training and experience for teaching Lab. Virtual lab Reduces work and time. It provides User friendly screens to enter the data. Virtual lab is web enabled portable and flexible for further enhancement. This paper can be highly beneficial for students who want to continue their study from e-learning programmes. Virtual lab provides the basic knowledge To the student who doesn't have any idea about the experiment. Virtual Lab adopts technologies from a wide range of fields.

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