

Introcution of Virtual Learnig System in Nigerian Schools

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ABSTRACT: This study explores the introduction of virtual learning system (VLS) as an integrated module of virtual classroom (VC) which can be applied to Nigeria's School system. Virtual classroom represents an interface between students and a virtual teacher and provides personalized learning materials to the users. The virtual learning system offers a possibility to the students to share curriculum resources at once as if they were at the same place where the real resources are, even when they could be at different institutions in different locations. In the system design, agents are used as entities that work on different tasks in the system. A set of agents of the same type is responsible for handling different users and their requests. The cooperation among agents is established through the act of exchanging messages. Virtual learning system is implemented in Windows 9x/NT environment, using Java for the agents' implementation suitable for Distance Learning Technologies.

KEYWORDS: *Web system, distance education, agents, Virtual Learning System, Java, XML*

I. INTRODUCTION

Children are curious as they explore life. That curiosity is what drives our quest for knowledge and understanding as young children. The problem though is that once we enter school we are separated into groups consisting of 30 students for every one teacher. It becomes overwhelming for the teachers as they are faced with 30 children who are at varying levels of comprehension. The result is that some children are left behind and others are bored and unchallenged. Both situations are not ideal and cause students to lose interest in school. In some Nigerian schools the situation is even worse as there are up to 50 or more students in a class some would be playing or fighting as teaching goes on. So how do we solve this problem?

The solution is in an integrated box called a virtual learning system (VLS) which has been designed in this paper for implementation in Nigerian School system. Every student is given the same opportunities whether they are from a small village school in Anambra State of Nigeria or a special city school in Abuja or Lagos. Gender, ethnicity, or socioeconomic class no longer determines the limits to opportunities. Victimization of students by teachers or cheating in examination by students will no longer be possible with VLS.

Web-based Classroom was suggested by [1,13] and was used to develop the 21st century models. ICT adoption into education has been widespread and often been premised on the potential of the new technology tools to revolutionize an outmoded educational system, better prepare students for the information age, and/or accelerate national development efforts. It is predicted [2] that the effectiveness of the use of the ICT in education may be an important factor in determining which countries will succeed in the future. The use of modern educational information and communications technology (ICT) in the construction of educational paradigm has irrevocably changed the way in which teaching and learning will be done in the 21st century[3]. According to [4], personalized learning materials can be created only if the system adapts to students needs shown in the student's interaction process. Hadengue [5] describes online learning, as an educational concept, which implies using local, extended networks, or the Internet to spread information, to communicate, and to support any other kind of educational interaction between students and teachers. The Virtual Colombo Plan [6] was launched by AusAID and the World Bank in 2001 with its goal: "To use the opportunities presented by Information and Communication Technologies (ICTs) to improve education and access to knowledge in developing countries" (World Bank & AusAID 2001, p. 21). Jenkins [7] posits that the students' learning activities requires the expert judgement of each individual teacher in their own specific setting, based on their personal experiences.

This paper presents a Virtual Learning System (VLS) that integrates Virtual Classroom (VC) services for application in Nigerian Primary and Secondary School Systems. The Virtual Classroom represents an interface between students and a virtual teacher (who could be at a distant location) and provides personalized learning materials to the users (students). Personalized learning materials can be created only if the system adapts to students needs shown in the student's interaction process. Such a process is supported with the help of several mobile agents with different specialities, such as an agent responsible for student classification and a set

of agents responsible for supporting learning activities such as finding the learning materials relevant to student's needs. The VC is considered only as a part of virtual learning system in schools, and, thus, a distributed architecture that can be reused is developed for any course material that can be activated in the VLS. The Virtual Learning System (VLS) offers a possibility to the students to share different resources (course materials) at once as if they were at the same institution where the real resources are prepared. The scenario is to employ the tool kit developed by Jensen et al [8] for educational visualization and simulation environments by Clients (students and teachers). In this case Clients run software that receives data over a network, displays graphics, and manages input. A client sends input back partly to the data generator via the server, and partly to other clients to support collaboration between synchronous peers. Jensen et al. [9; 10] specify details about the implementation of multi-user scenarios.

II. DESIGN OF VIRTUAL CLASSROOM FOR VLS IMPLEMENTATION

The main idea in the VC design is that users can log on from anywhere and that on the users end the only support necessary is the web browser. The whole system is web based and uses Java applets for its implementation. Figure 1 represents the activity diagram for the VC. A user logs on to the system through the supporting applet interface. If the user uses the system for the first time, he/she should register by filling in a registration form. Depending on the role in the system, - a student or a teacher, the user is provided with two different registration forms. The differentiation between the student's and the teacher's form is provided by two different login interfaces. The teacher may assist the younger students in this process. After the registration the corresponding student's or the teacher's profile database is updated.

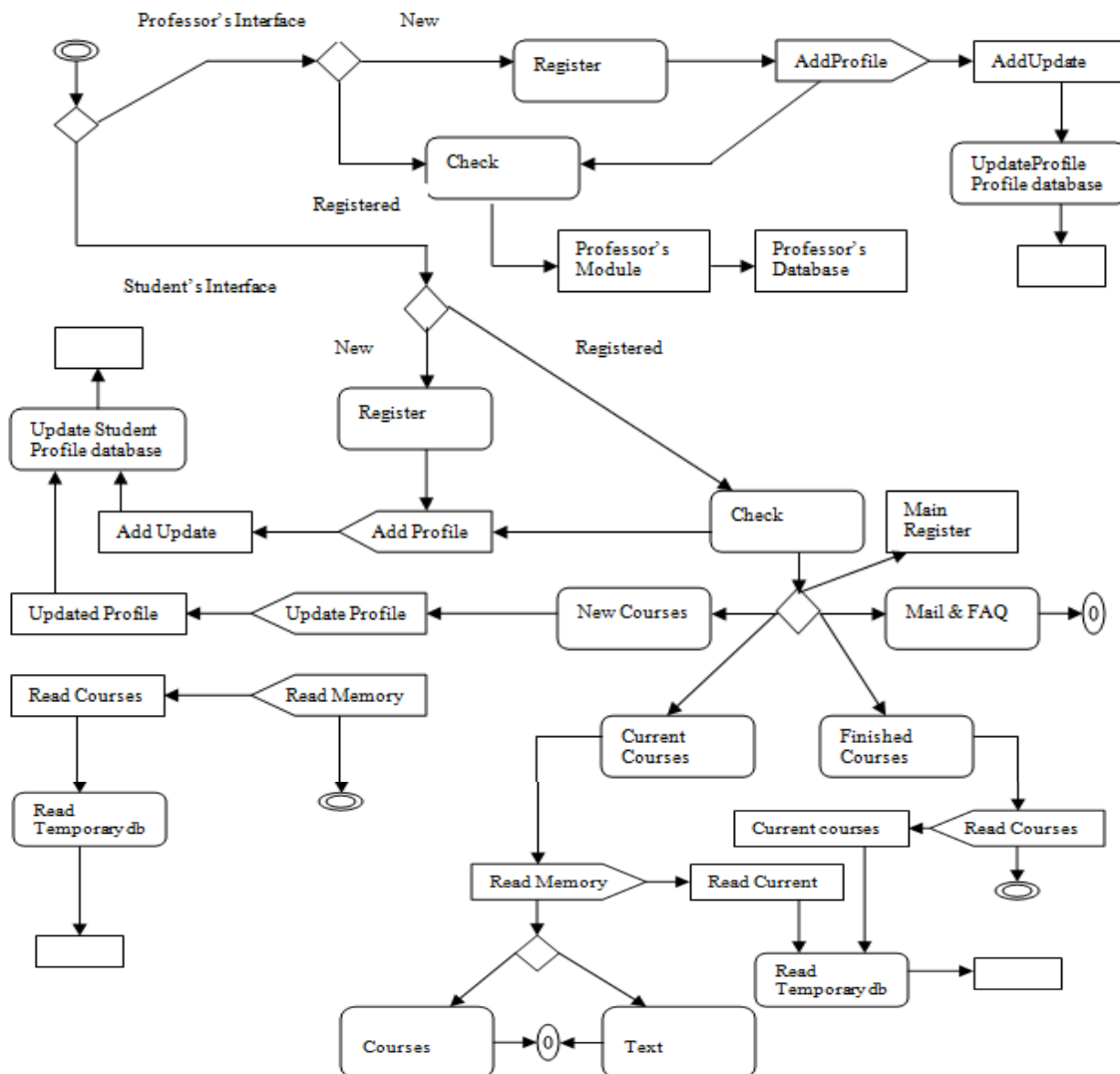


Fig. 1 Virtual Classroom Activity Diagram

Student’s registration is done through the student registration applet. Once the student logs on, the system opens the Student Main Panel. This panel allows the student to choose between several options. The teachers are following the other branch of the diagram that is supported with other modules of the system. These modules can be used by the teachers for updating, posting new courses or preventing information about students attending a particular course.

The VC is viewed [11] as an alternative to “classical classroom”. It can be used as an additional resource for material presentation in any course studied in schools. The present initiative is not intended to replace the classical classroom completely but to complement it. How is this possible? The new system will include [12,13] outlines of class, links to resources, selected clips, reviews, summaries and questions, extra practice questions, puzzles, and other materials that teachers find essential. Another benefit to the system is that a teacher is able to include notes, hints, and other material that students can look through as they study at home. And of course there will be a standard national program that will be included for each child according to grade level. The effectiveness of any educational material, though, is largely based on the effectiveness and preparedness of the teacher. Today many teachers in developed countries are provided with “21st century classrooms” that include a computer, a large screen television, and a VHS or DVD player that shows films or documentaries. Some teachers have turned to the technology era, but many in developing countries are not able to due to either the lack of computers or appropriate programs for the class.

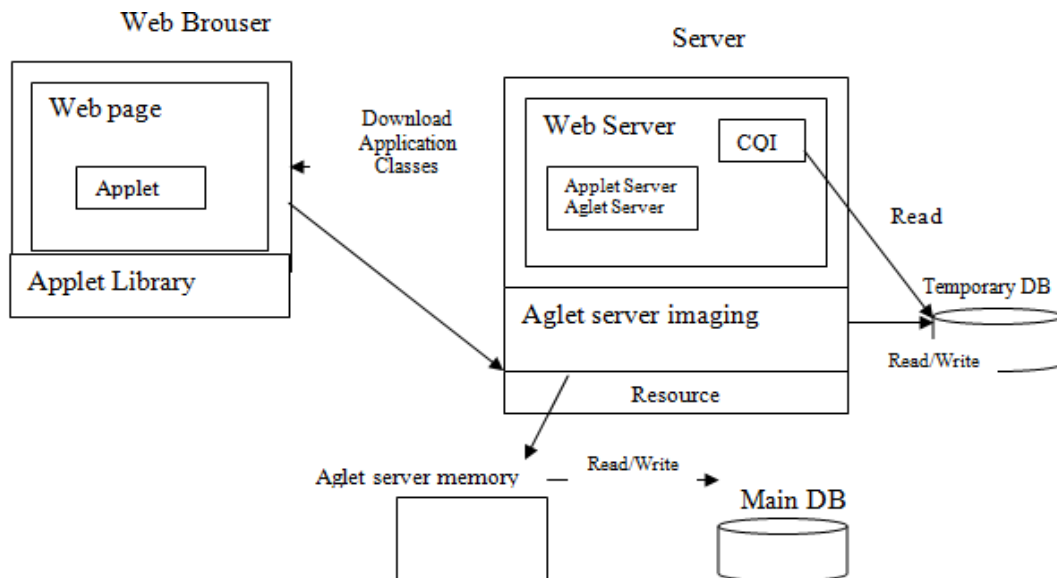


Fig. 2. The Virtual Classroom in action

III. RESULTS AND DISCUSSION ON VLS APPLICATION IN SCHOOLS

The Virtual Learning System designed for implementation in Nigerian School system will provide the 21st century classroom for the students. Course materials and examinations can be offered to students centrally from any location of the teachers. Children are curious as they explore life. That curiosity is what drives our quest for knowledge and understanding as young children. The problem though is that once we enter school we are separated into groups consisting of 30 students for every one teacher. It becomes overwhelming for the teachers as they are faced with 30-50 children who are at varying levels of comprehension. The result is that some children are left behind and others are bored and unchallenged. Both situations are not ideal and cause students to lose interest in school.

The solution is in an integrated box called a virtual learning system (VLS) which has been designed in this paper. Every student is given the same opportunities whether they are from a small village school in Anambra State or a special city school in Abuja. Gender, ethnicity, or socioeconomic class no longer determines the limits to opportunities. Victimization of students by teachers will become a thing of the past. Examination malpractices shall be eliminated with the use of VLS. The VLS system is designed to include outlines of class, links to resources, selected clips, review summaries and questions, extra practice questions, puzzles, and other materials that teachers find essential. Another benefit to the system is that a teacher is able to include notes, hints, and other material that students can look through as they study at home. And of course there will be a standard national program that will be included for each child according to grade level. The effectiveness of any

educational material, though, is largely dependent on the effectiveness and preparedness of the teacher. Today many teachers in developed countries are provided with “21st century classrooms” that include a computer, a large screen television, and a VHS or DVD player that show films or documentaries. Some teachers have turned to the technology era, but many in developing countries are not able to make a paradigm shift due either to lack of infrastructure, computers or appropriate programs for the class.

However, if each child had a virtual learning system, the teacher would be able to take advantage of the current technology. The system is similar to a laptop; however, it serves a different purpose. While at school, teachers will have the students place the systems into an indented dock that interacts with the system. The systems are then able to process information and resources from the main computer (the server) that the teacher uses.

IV. CONCLUSION

The design of Virtual Learning System that integrates the Virtual Classroom services was accomplished. An important extension of the system is the addition of a module for knowledge level estimation of the students. With the usage of software agents a certain transparency of physical allocation of the hosts in our system, needed for different types of data manipulation and resource sharing was provided. The usability testing results proved the system useful, intuitive and easy to use.

The results of VLS application revealed that the system is very useful not only for distance education but also for classroom implementation and provides links to external resources. When fully implemented, the system will introduce a paradigm shift in educational administration of Nigerian Schools.

Students will be assigned to a virtual learning system that will carry them through the first years of school (Primary School) to a Senior SecondarySchool (SSS) as in Nigerian School system. There will be no need for textbooks or a new system every year, since the teachers are able to update the programs on the systems as information changes. Also, there is no need for large memory space since the bulk of the information is kept in the main computers (the server) at school. In the long run money will be saved from not having to purchase new textbooks for all the years at school. If a system becomes damaged or lost the student is still expected to pay as he/she would for a loss of textbook. Moreover, the systems will have more benefits and uses than a textbook.

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REFERENCES

- [1]. Vladimir Trajkovic, DancoDavcev, Koran Kimovski, ZanetaPetanceska,(2000), “Web-Based Virtual Classroom”. In Proc. Of Tools 34 Santa Barbara, California USA, July 30 – August 4, 2000.
- [2]. Anyaegbunam, FNC and N.J Anyaegbunam, (2007). Socio-cultural Determinants of ICT adoption in Science education. Journal of Information Communication. 97-109
- [3]. Anyaegbunam NG and Anyaegbunam FNC (2007). Exploring the Role of ICT in Science Education. Journal of Information Communication. Pp.269-283
- [4]. Anyaegbunam FNC (2006). Virtual Learning System for Nigeiran Universities and Schools. Conf. Proc., Dinisat Europe summit, Norway, May 2006. www.dinisat.com.
- [5]. Hadengue, V. (2004). What can e-learning do for university libraries? *Library Review*, 53 (8), 396-400.
- [6]. World Bank & AusAID 2001, Virtual Colombo Plan: Bridging the Digital Divide: Joint Australian - World Bank Background Study, Commonwealth of Australia Canberra.
- [7]. Jenkins, E. W. (2000). What can physics teachers learn from research in physics education? *Physics Education*, 35(4), 245-249.
- [8]. Jensen, N, Gabriele, V, Wolfgang, N, Stephan, O (2005), “Development of a Virtual Laboratory System for Science Education”
- [9]. Jensen, N., Seipel, S., Nejd, W. &Olbrich, S. (2003) CoVASE --Collaborative Visualization for Constructivist Learning. *CSCL Conference 2003*, (pp. 249-253).
- [10]. Jensen, N., Seipel, S., von Voigt, G., Raasch, S., Olbrich, S. &Nejd, W. (2004) Development of a Virtual Laboratory System For Science Education and the Study of Collaborative Action. *ED-Media Conference 2004*, (pp. 2148-2153).
- [11]. K. H. Mardson, (1999): “The Diversity of Usability Practice” communications of the ACM vol.42,no. 5, 1999, pp60-62
- [12]. J. Buur, K. Bagger,(1999): “Replacing Usability Testing with User Dialogue”. Communications of the ACM vol 42. no 5, 1999 pp63-66
- [13]. Vladimir Trajkovic, DancoDavcev, Koran Kimovski, ZanetaPetanceska,(2005) “Virtual Learning System”. IRMA Proceedings, 2005