

Evaluating the Educational Institutions in Riverine Areas with the Application of a Web-Based Information Management System

Paul R. U¹, Okolo C. C², Ezeugbor I. C¹, Ngene C. C¹, Okafor O. O², Iwegbuna O. N¹

¹ Department of Computer Science, Nnamdi Azikiwe University, Awka

² Electronic Development Institute, NASENI, Awka Capital Territory

Date of Submission: 01-02-2023

Date of Acceptance: 10-02-2023

ABSTRACT

The educational achievement of pupils from equal socioeconomic backgrounds differs by region of the country they reside. Since their environs are susceptible to disasters like as floods, institutions in riverine locations such as Anambra West Local Government areas of Anambra State face low academic teaching and learning. Existing teaching and learning approaches, on the other hand, do not accommodate the negative consequences of the floods, such as the loss of teaching and learning resources, school absenteeism, and so on. Therefore, the study proposed a Web-based Information Management System to solve these issues and improve teaching and learning. For the analysis and implementation of the system, the Object Oriented Analysis and Design Methodology was employed. PHP 7 was used to create the application, with MySQL serving as the database management system. Once accepted, the technology would offer an online platform for continual learning, and enhancement of students' academic achievement. Keywords: Riverine; Floods; Local Government Areas (LGAs)

KEYWORDS: Information Management System, Riverine Areas, Existing System, Web-Based

I. INTRODUCTION

In Nigeria, the National Policy on Education (FRN, 1998) stated that the Federal Government has adopted education as an instrument for effecting National Development. The reason behind the move is not far fetches, since the success or otherwise of any nation depends on the literacy level of its citizenry. Just

like every other third world country, greater numbers of Nigeria's population are in the rural areas. Therefore, the campaign should pay adequate attention to these areas bearing in mind that lack of infrastructural development is a major factor militating against its development. Aliobu (2005) stated that education is seen as the major instrument, which can be used for developing our rural areas. For this to be achieved, the issue of insufficient teachers and inadequate infrastructure facilities in our rural secondary schools should be addressed.

Generally, education is the process by which individuals learn by subjecting to a selected environment for the purpose of attaining educational competence and optimal individual development. This means that for this to be achieved, there must be school where students should assemble physically in order to learn. In line with the national policy on Education (FRN, 1998), the federal government has not relented in the provision of infrastructures for affecting national development. This became the driving force behind the establishment of schools in riverine areas of the country in order to bring education to the door step of the rural and riverine populace.

However, in Anambra State, just like some other states located along the riverine, schools in riverine areas are characterized by the effect of natural disasters (flood). These effects such as: destruction of learning materials, submerge of school buildings, students/teachers absent from school, poor performance of students as a result of incomplete scheme of work and many more affects the aim of education in those areas. A typical example is Anambra West Local

Government Area of Anambra State where this study is focussed. In order to achieve the aim of education for all, a Web-based Information Management System for Educational Institutions (WEIMSEI) was developed. A Web-Based Information Management System for Educational Institution (WBIMSEI) is an organized online information management system that collects, stores, processes, analyses and disseminates information for students, teachers and school management.

II. METHODOLOGY

Research methodology is the procedure to be taken to achieve the objective of the research study. For instance, it clearly states how relevant information concerning the study would be secured and as well as shows the instruments and techniques of analysis that would be employed. Also, there is acceptable international system development standard for transforming ideas into the design. Some of the existing and proven methodologies include:

- i. Prototyping.
- ii. Object-oriented analysis and design Methodology (OOADM).
- iii. The structure system analysis and design methodology (SSADM).
- iv. Expert system methodology.

In this research, the methodology of analysis and design techniques adopted is the Object-oriented analysis and design Methodology (OOADM). The following are the components of procedure involved in the use of OOADM model which has been adopted in carrying out this research.

Analysis of the Existing System

The existing system was thoroughly analysed by the researchers with a view to discover the problem facing it. The detection of these problems helped to prevent errors in the design of the new one. The present Educational System in Anambra West Local Government Area uses manual system, whereby the teachers must be physically present in the classroom before lesson will commence. It was observed that between July to October of every year, which falls within first term and second term in secondary school academic calendar, the schools in the above Local Government Area often encounter flood and growth of water hyacinth as a result of excessive rainfall. The school environments, its equipment, learning materials and the students of these communities are adversely affected by the flood

within this period. Also deposit of water hyacinth posed difficulties in the attempt to evacuate students in those communities of Anambra East Local Government Areas whose areas have been flooded. The students find it extremely difficult to go to school. Even when they intend to attend other schools within that period to meet-up with their learning processes, engine boats and canoes, which serve as the means of transportation could no longer sail freely on the water because of water hyacinth, making it difficult for them to attend other available schools.

It was also observed that floods often encroach in the schools during the termly examination, which in effect prevents the school management from organizing examinations and the students from taking the proposed termly examination. This is because the school would be flooded and the students would be at their various homes. This is a very serious problem as the school management would not be able to do proper evaluation of students' performance and in so doing, finds it difficult to promote students to the next level. This would result to all the students moving to the next class without proper assessment. The teachers on the other hand do not come to school during this flooding season. In so doing, they would not be able to cover their syllabuses and scheme of work, leaving the students not well equipped for external examination or competitions among their peers in other schools. Some teachers, when posted to those riverine areas, will not attend classes and their colleagues that managed to attend will be writing attendance for them, thereby falsifying staff attendance records book. Yet they will be receiving salaries. Others will refuse the offer of appointment, as a result of fear of the flood or entering canoe to the school.

Students of those areas, during this season will stay at home and engage themselves in fishing. By the time the flooding season will be over, they will be facing their external examinations such as WAEC, NECO or NAPTEB. It was observed that majority of the students often fail their external examination, some usually lose their valuable school certificate/properties that would have given them the opportunity to go further in their education. This often demoralises them and many will not be able to further their education and simply drop out of school. Consequent upon which, some girls will be engaged in early marriage while some boys will start hustling at such early stage of life.

Activity Procedure of the Existing System

The Data Flow Diagram for the existing system was analysed using Gane and Sarsen's approach. Figure 3.1 depicts the data flow diagram for the existing system.

Advantages of the Existing System

The educational system in Anambra West Local Government Areas of Anambra State takes place within a short period of time, the teachers will be around before the flood. Some students, during this season, go into fishing to earn money for lost materials and school fees. The environment during flood is richly blessed as different sizes of fishes will migrate from the river to the community, thereby enabling them to catch enough for sales. The environmental benefits of flood can also help the community through fish production, recharge of ground water resources and maintenance of recreational environments. The old system is cost effective. The students don't have to subscribe to download lesson notes or watch lesson videos. They are always in one-to-one learning with their teachers and be able to interact with the teachers when needed.

Disadvantages of the Existing System

1. All children have the right to secondary school education. But in the riverine areas, thousands of secondary school-aged students are out of school. This is due to excessive rainfall that causes flooding of the areas. This has devastating impacts on students' education. Flood has pushed thousands of students out of school. It also affects the enrolment of students in those areas.

2. Disasters like flood poses enormous challenges to students. Their educational system is disrupted when schools are damaged or destroyed, roads are blocked, teachers are absent, and some unaffected schools are used as emergency accommodation for the displaced schools and inhabitants. Students in Riverine areas are afraid to go to school, because of the fear of flood

3. Some students who are forcefully displaced from their homes become traumatised for a long periods of time and they also face additional other challenges. They will not participate actively in the school activities or in the subjects taught at the school. They face challenges accessing education due to having lost all personal identity documents and other important school documents and files.

4. Teachers on the other hand will be out of school during the flooding season. An attempt to complete the school syllabus proves abortive, thereby making it difficult for the students to face the challenges of participating in interschool competitions, exhibitions and above all the external examinations.

Analysis of the New System

After studying the old system and data collected, a new system is designed to eliminate the problems of the old system. The proposed system will be basically used by the students, teachers and school management to bridge the gap in educational activities due to flooding.

The proposed system would be designed to have features such as the login form (which enables a registered user to have access to the application and also prevent unauthorized users), the main menu (serves as the home page through which the users can navigate other forms of the application), the new students and teachers registration forms, Students/Teachers database tables (for storing records respectively) and the output form (enables the students to download/copy their notes of lesson, syllabus, write test and examination).

The function of the new system is such that the school management will first of all register all the students and teachers to the school database, upload scheme of work, examination questions and results. During the flood season when the affected schools will be closed and the students will be at their various locations, the students (registered students) are expected to log in to the website, and from the displayed time table, select the subject they have at that moment. This action will take the students to the page where they can download lesson videos, note of lesson or scheme of work and chart with the subject teacher, take and submit class exercises/quiz and write and submit assignment.

The teachers (registered teachers) on the other hand, are expected to login to the site during the time they have classes according to the displayed time table, upload their lesson videos, note of lesson, quiz or class exercise if any and chart with the students that will be present online.

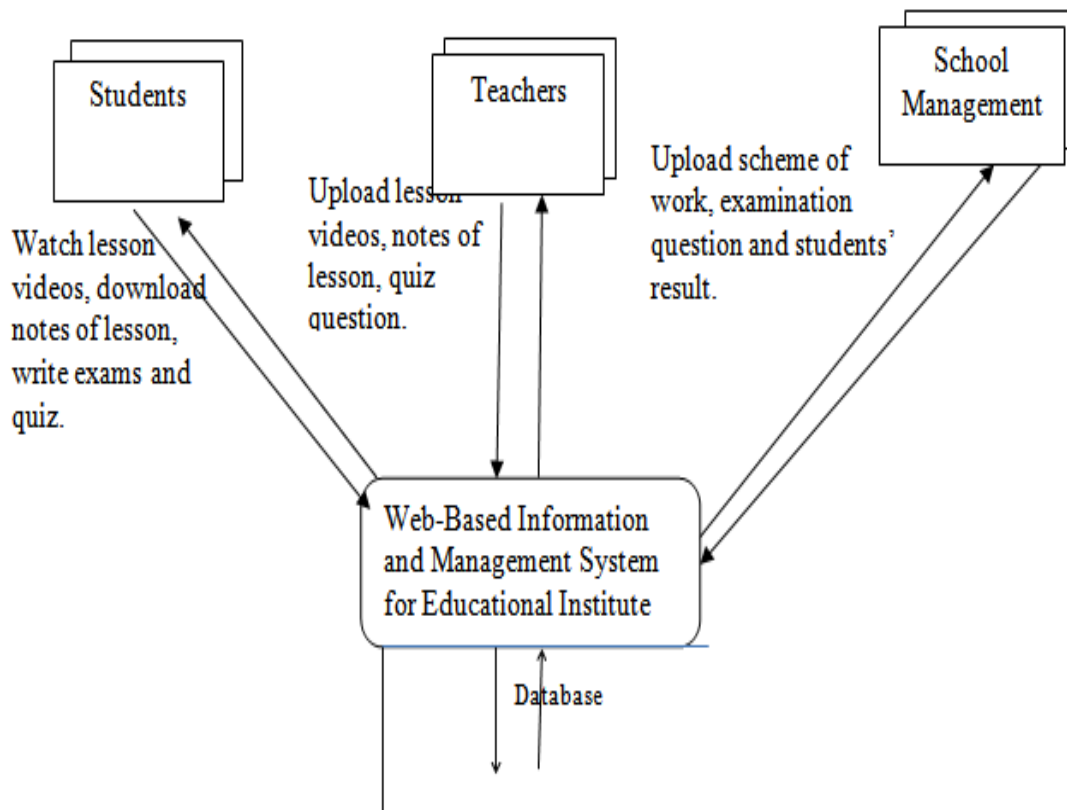


Figure 1.0: Data flow diagram of the new system

Justification of the New System

The following are the bases on which the implementation of this system will be able to overcome all the problems of the existing system:

1. The proposed system will be of great benefits to the students because it will provide a platform that will enable them to learn their various subjects online at their different locations/houses. The system will help to fill up the gaps of teachers' absence during flood season. It will also help the students to continue learning without missing lessons, helps prepare them to cover their syllabus and scheme of work and download note of lessons in order to be well equipped for external examinations and inter-school competition.
2. The designed system will support the teachers who have large scheme of work to complete their syllabus. This means that a teacher can stay in his/her home to deliver his/her lessons, give

project, quiz and assignment to the students and also set examination questions for the students during flood seasons.

3. The study will be of great benefit to the school management. It will enable them to build a database of all the students and teachers of the school, administer examinations, evaluate and determine the students' performances at the end of every term. With the platform, flood will no longer be an obstacle for not talking end of the term examinations.

III. RESULTS

System Flowchart

The flowchart of the New System is shown in the figures 4.8, 4.9 and 4.10.

Figure 4.8 describes how a user can access the application.

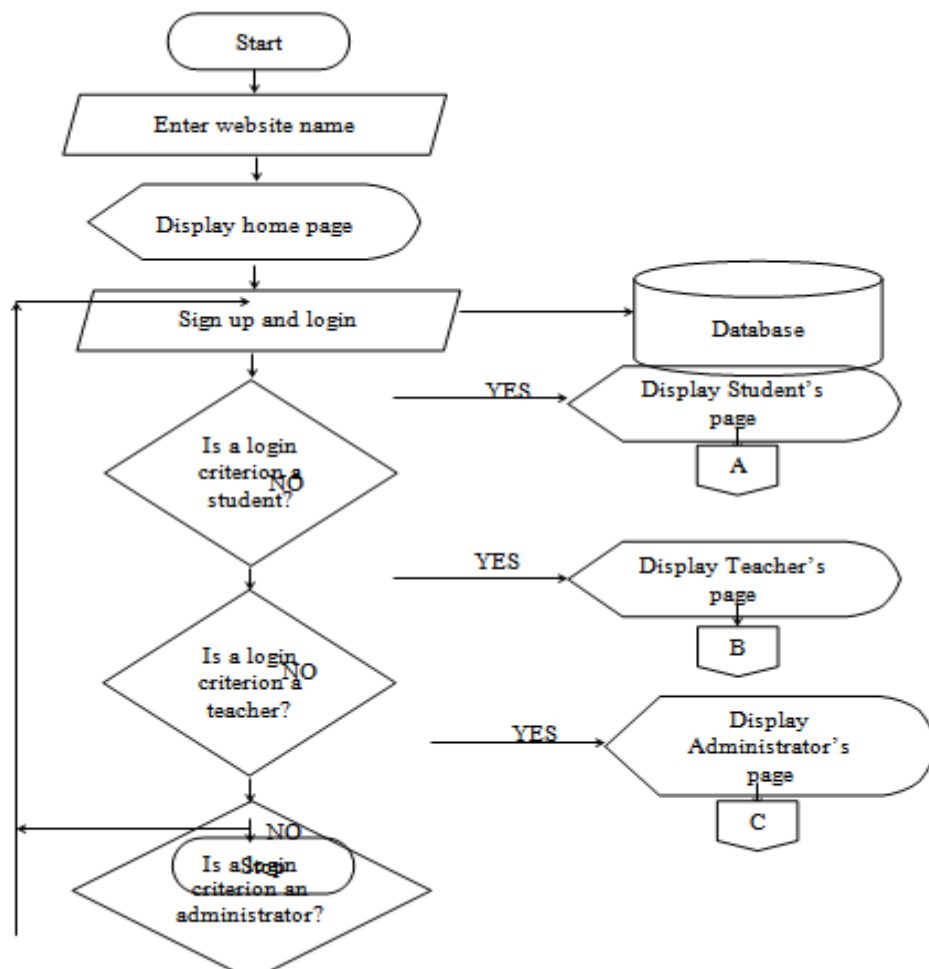


Figure 2.0: The System Flowchart

New System Requirement: The following are the requirements for the new system. Minimum hardware and software requirements are needed for our application to run on a development/ local environment, as soon as it goes live. All that is needed to run it is a modern web browser on any device, Desktop computer, Laptop, Tablet or mobile phone.

Hardware Requirements: Server Requirements: Pentium (R) Dual – Core running at 3.20 Hz with minimum of Microsoft Windows Server 2000, at least 4 gigabyte of Random Access Memory (RAM) and at least 80 gigabyte of Hard Disk.

ii. Workstation or Client Requirements: Pentium (R) Central Processing Unit (CPU), at least 1 gigabyte of Random Access Memory (RAM) and at least 10 gigabyte of Hard Disk

iii. Other Hardware Requirements: Printers, Web, Digital or phone Camera and Scanners.

Software Requirement: An Operating System: Microsoft Windows 7, Linux or OS X, PHP 7,

Web Server , Database (MySQL preferred), Code editor and Web Browser

Program Development: Our choice of programming language adopted for this project is HTML, CSS and JAVA SCRIPT as front end, while PHP was used as the back end. The reasons for choosing the above programming language are because:

On the back end, we made use of PHP (Hypertext Pre-processor) for the scripting language and Mysql for database storage.

System Testing: The researchers adopted three levels testing methods in testing each subsystem before integrating the subsystems together in our testing plan. Module testing is carried out by feeding in data respective individual module and checking the output performed in order to ensure conformity with the expected results. Integration testing followed suit after linking the module to the respective subsystem in order to ensure non discrepancy with expected performance and output of the subsystems respectively.

Test Plan: The purpose of test plans is to highlight different strategies that will be used to test the system. This test plan maps out sequence of steps and procedures that will be used to test the system under consideration to ensure that they meet specific requirements. Some of the tests carried out on the system include codes used. Portability test was also carried out to see if the system works on varying platforms. Integration test was also carried out to ensure that the different modules intercommunicate as required and if as a whole, there is coordination.

Test Data: Data used for processing were gotten from the school management, specifying each registered student, courses and syllabus offered by each registered student at different academic level and also examination questions to take and the results. The following are test data; Start of program execution to display the Main menu item, login into the system, add new students/teachers and display neither lesson videos, notes of lessons, scheme of work, quiz or exam questions.

Limitations of the System: Several factors posed as limitation in the process of carrying out this work. The factors include the following:

1. A connection to the web is needed to access the information, which will be impossible if a computer and connection is not available.
2. Site may be difficult to use if experience with the internet is limited.
3. Inadequate power supply can affect the effective use of the system.

System Conversion: System conversion is changing from the old system (existing system) to the new system. Conversion can involve hardware, operating system (OS), database management system (DBMS) and the database or application it supports.

Changeover Procedures: System changeover is concerned with the smooth shift from one way of doing things to another and the mitigation of disruption to business activities during the changeover. There are three main methods used: phased implementation, direct changeover and parallel running.

Recommended Procedure: We recommend that the parallel run changeover procedure should be adopted. The reason is because in this type of changeover process, both the old and new systems are used side-by-side. Also, in case the new system fails, the functionality of the existing system will not be altered and the organizational data will be protected.

System Security: Storing all user passwords as clear text can result in a massive security breach if the password file is compromised. One way to reduce this danger is to only store the hash digest of each password. This system security is achieved using Bcrypt. A Bcrypt is a password hashing function used to authenticate a user. The password presented by the user is hashed and compared with the stored hash. Note that this approach prevents the original passwords from being retrieved if forgotten or lost, and they have to be replaced with new ones. With this security major, user passwords are protected against being read from the system.

Data validation is another system security used to ensure that data have undergone data cleansing and to ensure they have data quality. It also ensures that data entered into the system are all correct and useful. It uses routines, often called "validation rules" "validation constraints" or "check routines", that check for correctness, meaningfulness, and security of data that are input to the system. The rules may be implemented through the automated facilities of a data dictionary or by the inclusion of explicit application program validation logic.

Training of Users: Design and development of a new system entails changing from the old/manual system to a computer based system. As in common with every new invention, the entire staffs that make use of the system must acquire certain level of training before they can efficiently exploit the potentials of the new system. New users of the system should be trained and retrained whenever there is any adjustment on the system. In the case of this system, three classes of users – the school administrators, teachers/tutors and students were considered.

IV. CONCLUSION

Web-based Information and Management System for Educational Institution has been designed to overcome the problems encountered by the students of riverine areas which seriously affects their educational system. The researchers have tried as much as we can to make this project as user friendly as possible. We also tried to see that the anticipated aim and objectives for the application were achieved. The system, if adopted, would help to improve the academic performance of the students in riverine areas and make the students to have the zeal to study online irrespective of the flood season. It will also strengthen the productivity of educational system of the areas. Hence, immediate implementation of the new system in the secondary schools in Anambra West Local Government of Anambra

State is essential as it will bridge the gap of teachers' absence in school during the flood season and enable the students to continue learning.

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