

Design and Development of an Online Instruction for Economics Students of Abia State College of Education (Technical) Arochukwu

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Abstract- *The usual face-to-face teaching and learning in the department of economics is not enough considering the workload before the lecturers. The workload can be reduced drastically by deploying online instruction as supplement. Hence, the researchers designed and developed an online instruction for economics students. With this online instruction in place, lecturer/admin can add new and/or updated learning materials at anytime. Students on the other hand can learn economics courses at anywhere and at anytime. Each course in the online instruction is accompanied by multiple choice tests where students can test their understanding of the materials covered. Lecturers and students can view students result immediately after the test. In addition, lecturer/admin and course representative can send messages to students. The Online instruction system was implemented using html, PHP, CSS and Javascript web technologies. The developed online instructional system was tested by 12 staff and students of the College. Thereafter, a questionnaire designed to measure user's satisfaction with the use of the developed system was administered to the staff and students that tested the system. The data collected from the questionnaire was then analyzed. The result of the analysis shows that the respondents are satisfied with the performance of the developed online instructional system. Furthermore, the respondents recommended that the developed online instructional system can be used in the College for teaching and learning of economics courses.*

Keywords: *Design, Development, Economics Education, Online Instruction, Abia State College of Education (Technical) Arochukwu*

I. INTRODUCTION

Unarguably, the field of economics evolved as a result of the phenomenon of having human wants exceeding the productive capacity of scarce resources. In this sense, McConnell and Brue (2008) defined economics "as a social science concerned with optimal (best) choice under conditions of scarcity". Economics subject matter has four main

components which includes (i) production (ii) exchange (iii) distribution and (iv) consumption. The knowledge gained from economics expands and sharpens one's common sense (Bowden & Bowden, 1995). The knowledge gained from economics also enables one to manage resources effectively as well as be in the right position to understand and analyze economic policies and programs of the government (Ede, 2015). Additionally, benefits that students could gain from studying economics to include: better decision-making skills, a better understanding of human behaviours and capacity for self-employment (Mermen, Papa & Webber, 2010). All these expositions points to the fact that knowledge of economics lead to the prudent management of resources.

The knowledge of prudent management of resources can be acquired through trial and error, but can best be acquired through education. Micheal (2015) refers economics education as type of education with the objectives of not only promoting knowledge of how to be prudent in resource management but also equipping students with skills to contribute to national economic policy formation and debates. Blaug (1990) sees economics education is any effort designed to increase people's understanding of economics facts, concepts, principles and problems. The objectives for the economics course at secondary level of education according to Zephaniah and Dauda (2020) are : (i) to equip students with the basic principles of economics necessary for useful living and for higher education, (ii) to prepare and encourage students to be prudent and effective in the management of scarce resources (iii) to raise students respect for the dignity of labour and their appreciation of economic, cultural and social values of our society (iv) to enable students acquire knowledge for the practical solution of the economic

problems of society; Nigeria, developing countries and the world at large. On the other hand, the objectives of economics education in Nigerian Colleges of education according to National Colleges of education, NCCE (2020) includes (a) train teachers who have acquired in-depth knowledge of economic theory and applied economics to be able to appreciate economic problems;(b) produce teachers who have acquired adequate paraprofessional skills to be able to organize and teach economic related courses at the primary school level in Nigeria;(c) prepare teachers who would be able to undertake further education in economics or related areas of study and (d) produce teachers who have acquired economic skills and abilities and are able to apply them to their daily activities.

Achieving objectives of economic education in secondary schools as well as in Colleges of education requires economics teachers to apply effective teaching methods and instructional materials among others. Olakunle (2020) observed that economics teachers have converted the subject into a sort of social mathematics in which analytical rigour is everything and practical relevance is nothing. with little emphasis on the practicality of the content, the skill needed by the students to cope with understanding the nitty-gritty of the subject becomes difficult, if not elusive. Olakunle (2020) concluded that the core of this problem may have stem from teachers restricting themselves to certain types of methods or in specific terms over-reliance on traditional methods of disseminating instruction, such as lecture method and the use of standard textbooks as the main resources for students learning.

One of the solutions to the above instructional problem is the use of innovative sources such as games, the internet, movies or video clips and use of other multi-media devices which present opportunities for students to discover and express themselves more easily through a more stimulating techniques as well as a conducive atmosphere that make lessons more interesting and enjoyable to students (Ongeri, 2015; Olakunle, 2020). Of these innovative sources, online instruction appeared to be the most frequent source used by lectures in tertiary educational institutions.

Online instruction in simple terms is a type of instruction deliver via web or internet. However, in more elaborate form, NCES (2008) refers online

instruction as instructional process in which students and instructor are not in the same place. Online teaching and learning enable students to learn anywhere, anytime and at their own pace. With online instructional systems, students can(i) access content via internet, download content to view offline;(ii) participate in discussions, blog;(iii) type assignments in Google Docs and upload to either clickUP assignments on Turnitin from their Google Drive;(iv) do tests; (v) participate in collaborative sessions (viewing, chatting, speaking, sharing video and(vi) view grades(University of Pretoria,2020). It is with these overwhelming advantages of online instructions that the researchers set out to design and develop an online instruction for economics students of Abia State College of Education (Technical) Arochukwu.

II. PROBLEM STATEMENT/JUSTIFICATION

Economics department is one of the departments in Abia State College of Education (Technical) Arochukwu with the large number of students. This implies more workload for the lecturers in the department. Indeed, the low number of lecturers (three lecturers) couple with relatively large number of students makes teaching and learning not easy in the department. Furthermore, the use of traditional teaching methods such as lecture method compounded the problem. But with advent of online teaching and learning, department of economics can leverage on this technology by developing online instructions and deploy them through the College upgraded website. This will indeed not only reduce the workload of lecturers, but also enable students to learn at anytime, anywhere and at their own pace. This will also reduce the financial cost of teaching and learning as print instructional materials are not required in this approach. Hence, the researchers set out to design and develop an online delivery system for economics students of Abia State College of Education (Technical) Arochukwu.

III. OBJECTIVES OF THE STUDY

The major objective of this study is to design and develop an online instructional delivery system for economics students of Abia State College of Education (Technical) Arochukwu. Specifically, the study will:

1. Determine the online instructional system specification requirements
2. Design the online instructional system.

3. Develop the online instructional system.
4. Test the online instructional system
5. Determine user's satisfaction with the performance of the online instructional system.

IV. LITERATURE REVIEW

This section first introduces the concept of online instruction. The section then presents two Course Management Systems (CMSs).

Concept of Online instruction

Online instruction in simple terms is a type of instruction deliver via web or internet. Online instruction is a mode of instruction in which most or all of the course content is designed intentionally for digital delivery. An online course encompasses the thoughtful design of instruction, assignments, engagements, and interactions that promote successful learning in a fully online environment. Cable and Cheung.(2017) identified eight principles guiding online instruction. The eight principles are;(i) encourage student-faculty contact;(ii) encourage collaborative learning;(iii) encourage active learning;(iv) give prompt feedback;(v) emphasize time on task;(vi) set and communicate high expectations;(vii)respect diverse talents and ways of learning and (viii) technology application. Figure 1 depicts the eight principles.



Figure 1: Eight Principles of Effective Online Teaching Framework

Course Management Systems

Course Management Systems (CMS) provide a range of tools to support learning and the administration of courses in an online environment. They are centralized software platforms that facilitate online learning activities. CMSs also known as Learning

Management Systems (LMSs) generally includes software for creating and editing course content, communication tools, assessment tools, student data tracking, and other course management features. Through a CMS, instructors can deliver virtually any content to students that could be delivered in a traditional face-to-face setting. Examples of commercial systems include: Blackboard ,ANGEL , or Desire2Learn . Examples of open source systems include: Moodle ,Sakai , or Atutor(Raga,2008). This section presents two types of CMSs; Blackboard and Moodle. The knowledge gained from these two systems will guide the design and development of the system under consideration.

Blackboard App

Blackboard App is one of the online management systems developed for teaching and learning of various subjects. Blackboard according to John Jay College (2020) contains the following; (i) *course shell*: a course shell is the basic blackboard repository for all of the content, materials, and activities for a particular academic course. A course shell is automatically created for every course listed in CUNYfirst, and all enrolments (both students and faculty) are processed automatically based on CUNYfirst enrolment data. (ii) *organization shell*: A blackboard repository for content, materials, and activities for non-academic and non-credit earning campus groups, such as academic departments, student activities groups, and cocurricular training. Organizations feature all of the same functionality as course shells.(iii)*course copy*: course copy is the Blackboard function by which an instructor can copy content, materials, and activities from one course they are teaching to another. Some of the uses of Blackboard APP include; (i) access content via internet, download content to view offline;(ii) participate in discussions, blog;(iii) type assignments in Google Docs and upload to either clickUP assignments on Turnitin from their Google Drive;(iv) do tests; (v) participate in collaborative sessions (viewing, chatting, speaking, sharing video and (vi) view grades(University of Pretoria,2020).

Moodle APP

Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment. Moodle is a large, Web-based software package that enables instructors, trainers, and educators to create Internet-based courses. Moodle provides a robust system and an

organized, easy-to-use interface for learning over the Internet. One of the greatest advantages in sticking with Moodle is that developers have kept the look and feel consistent over the years, and they promise to continue to keep it consistent so that each upgrade doesn't feel like it's a piece of new software. Moodle enables educators and trainers to create online courses. Moodle's home page (Moodle also calls it the course front page) displays, in its basic form a link to a list of participants (including the teacher and students), a calendar with a course schedule and list of assignments, resources, activities, updates, and news. Moodle is referred to as a course management system (CMS), learning management system (LMS), virtual learning environment (VLE), or more recently a learning content management system (LCMS)(Dvorak,2011).

V. METHODOLOGY

This study adopted waterfall with feedback development model as depicted in figure 2

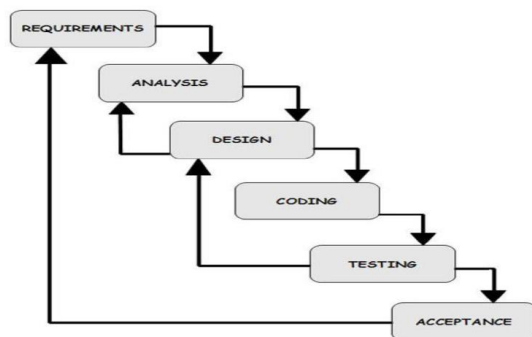


Figure 2: Waterfall model with feedback

Hardware Requirements

- (a) RAM: 1 GB or above
- (b) Hard disk: 4 GB or above
- (c) Processor: 2.4GHZ or above

Software Requirements

The following specification are needed

- (a) Window 10
- (b) MySql
- (c) Microsoft visual studio
- (d) XAMPP
- (e) phpMyAdmin

System Users

1. Admin
2. Student
3. Visitors

Functional Requirement Specifications

Admin/Lecturer

1. Login and logout
2. Add username and password
3. View, add, delete, update and print student records
4. Add new or updated instructional materials
5. Send notice to students
6. View students' results
7. Print students' result

Student

1. Login and logout.
2. Take lesson
3. Take test
4. View result
5. Print result

Visitors

1. View information about the College
2. View College contact information

Non-Functional Requirement Specifications

1. Provide data security
2. Be efficient during operations
3. Be portable
4. Be reliable
5. Accommodates more than 10,000 records
6. Be Scalable
7. Be robust
8. Maintainable

Design

System Architecture

The project adopted client-server architecture with three layers; the presentation, application and the database. The presentation layer consists of the browser. The application layer is the, Graphical User Interface (GUI) while the database layer serves as the database system (MySQL). The system architecture is shown in figure 3.

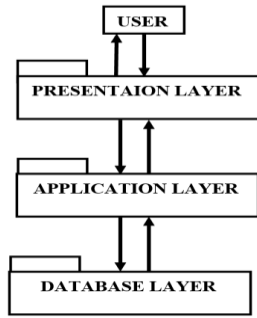


Figure 3: Three Layer Architecture

Use Case

The Use case diagram that shows the major functions of the users using UML (Unified Modelling Language) is shown in figure 4.

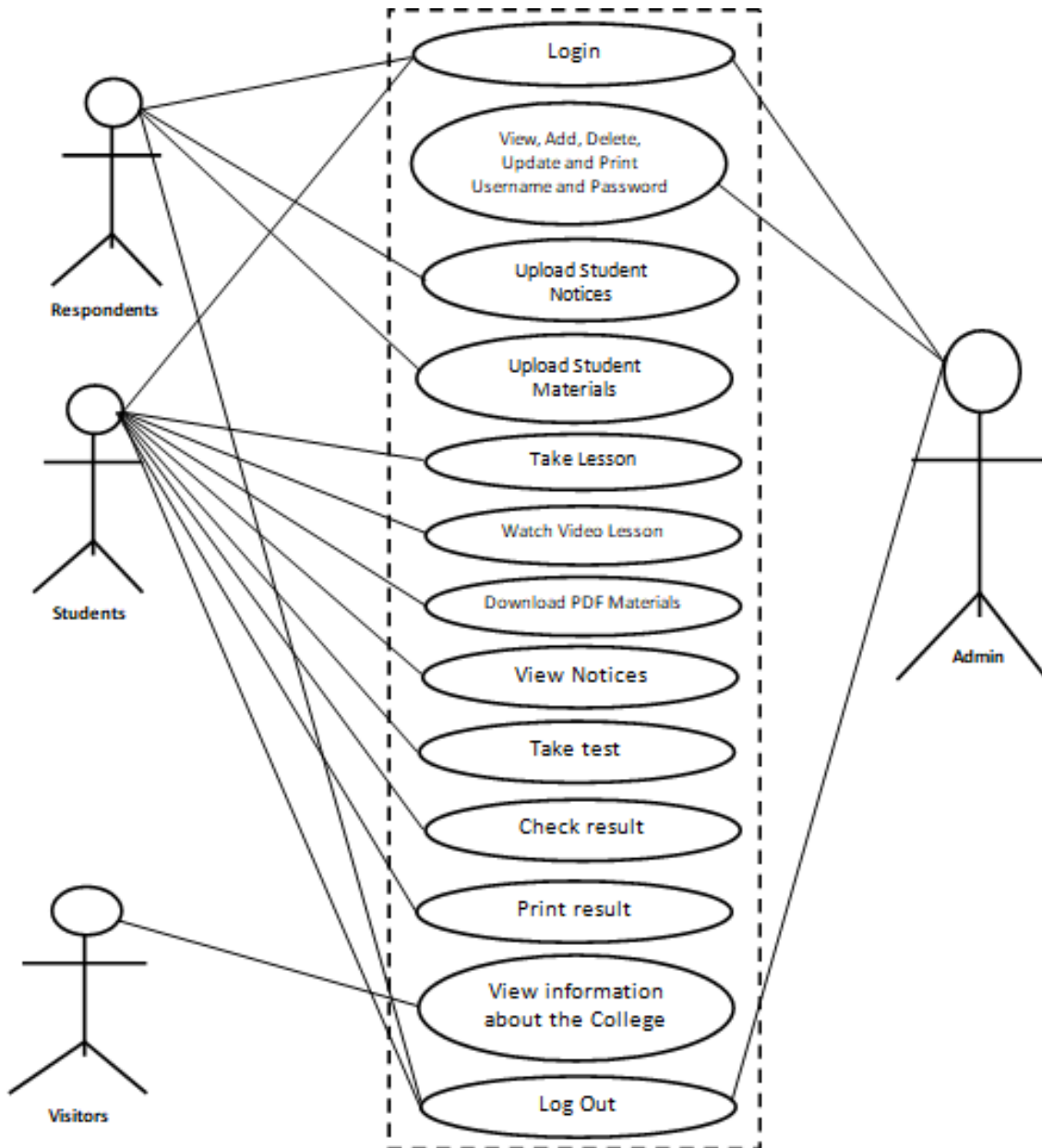


Figure 4: Use case

Database Design

This project made use of MySQL database to store all the information required by the system to function.

The database named economics_db contain two tables. Figure 5 shows the two tables. The database and its tables were created using *phpMyAdmin*.

admin_login_tb	result_tb
SN	user id
username	Firstname
password	Middle_name
	Last_name
	Application number

Figure 5: Database tables

VI. IMPLEMENTATION

Writing Program Code

The project was implemented using PHP and javascript programming languages. The database and

its tables were constructed using *phpMyAdmin*. The codes were written under Microsoft visual studio.

Sample Outputs

The following are a sample of the outputs of the system when running.

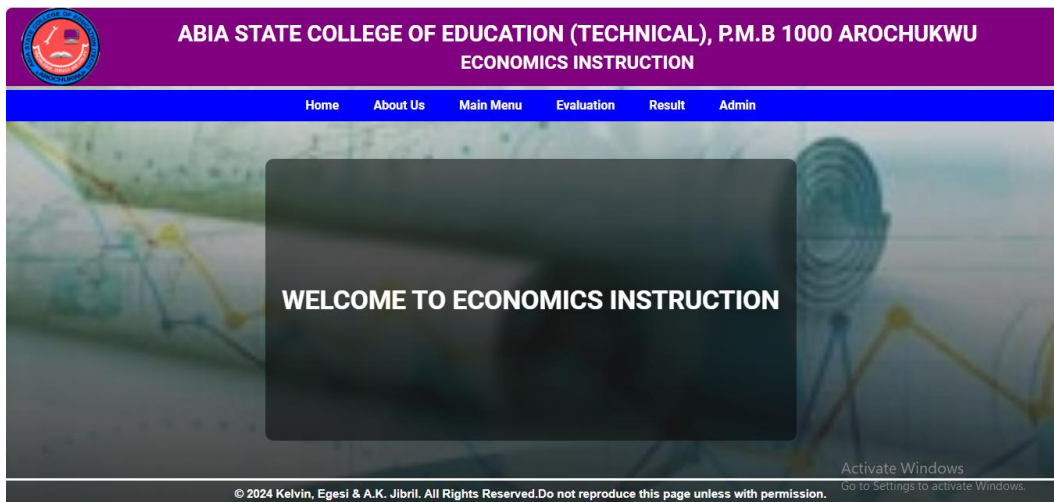


Figure 6: Home Page

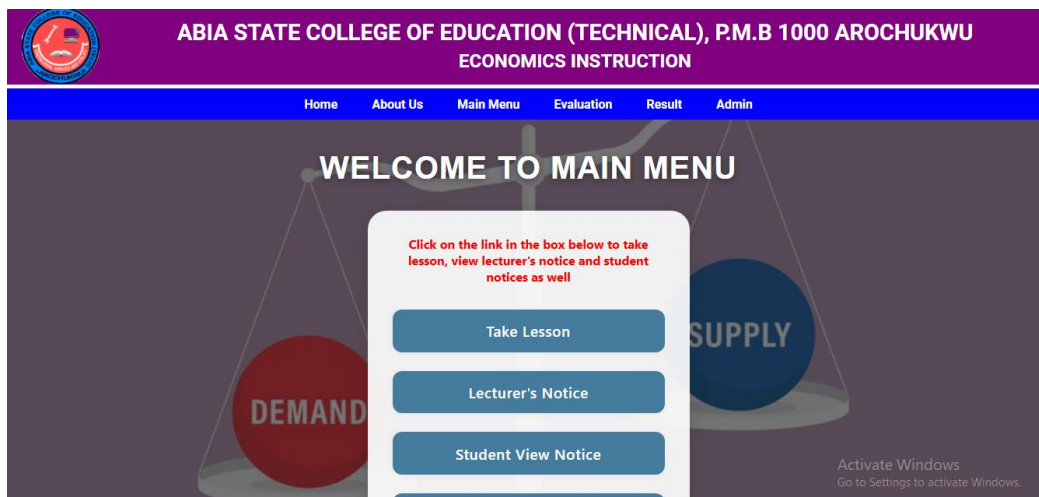


Figure 7: Main menu

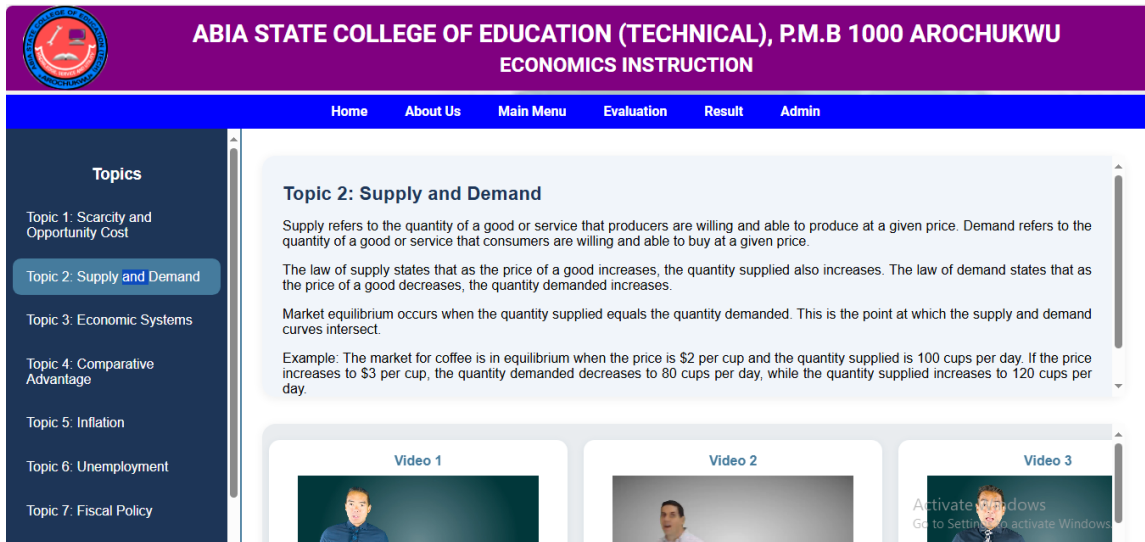


Figure 8: An instructional environment

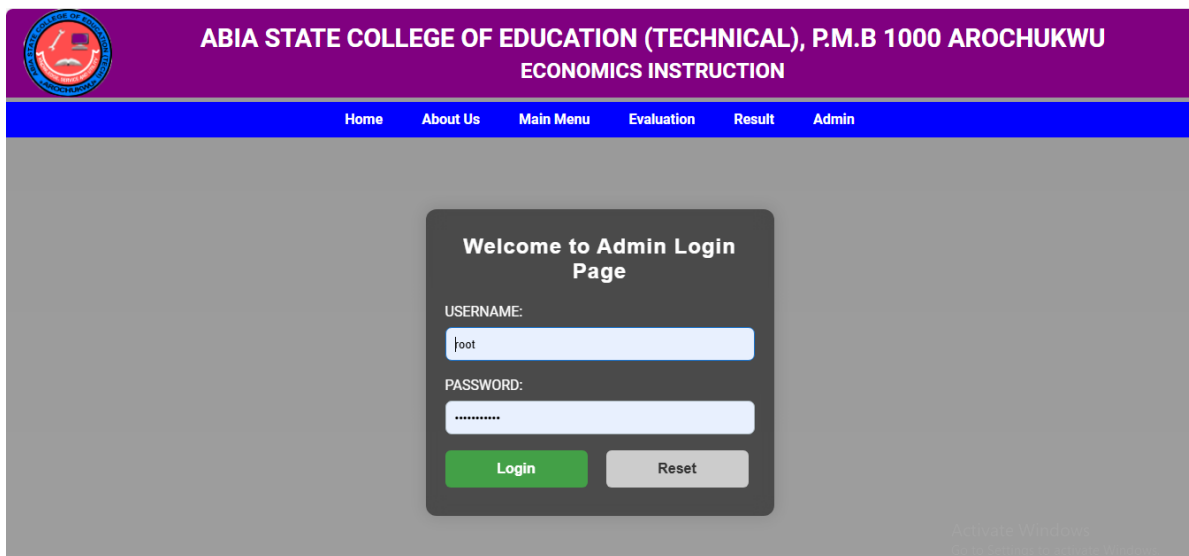


Figure 9: Admin Login form

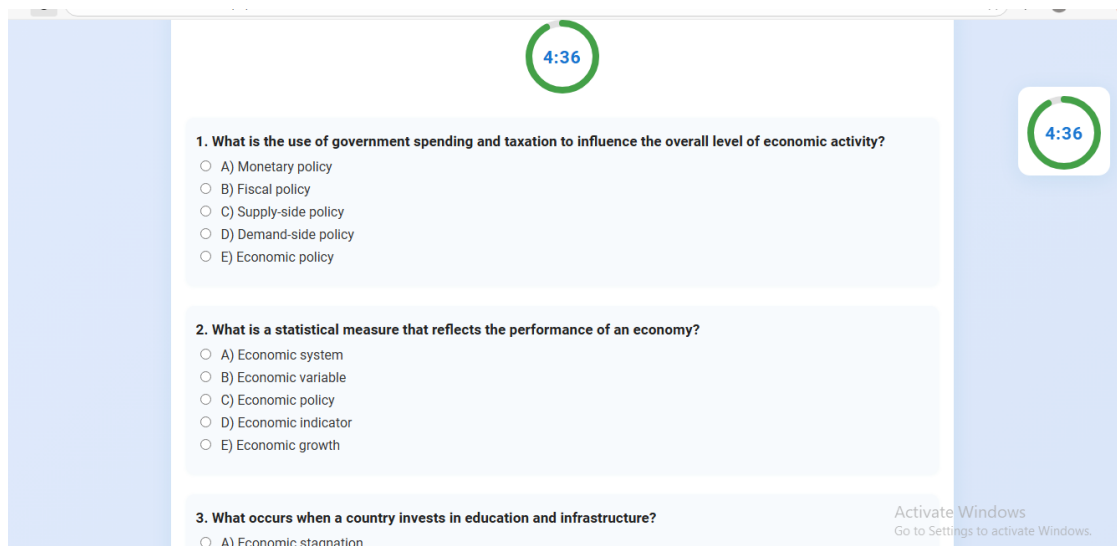


Figure 10: A testing environment

Result Details	
Name	Okoroafor, Samuel kanu
Registration Number	N/20/CPE/9033
Course	Economics
Level	100
Semester	First
Score	10
Remark	Fail

Print Result
Back

Figure 11: Student result Page

Testing and Evaluation

The researchers tested each newly created file and make necessary correction(s) before creating another one. Thereafter, 12 staff and students were asked to test the new developed system. After testing the

system, a survey questionnaire designed to measure users' satisfaction with the performance of the system was issued to them. The data collected from the questionnaire were then analyzed, The result of the analysis is shown in table 1.

Table 1: Mean and Standard Deviations of the responses of Staff and Students

N=12

S/N	Item	\bar{X}	SD	Remark
1	The software enables admin to add username and password	3.75	0.45	Agree
2	The software enables admin to login	3.75	0,45	Agree
3	The software enables admin to logout	3.58	0.67	Agree
4	The software enables admin to update and delete user record	3.75	0.45	Agree
5	The software enables admin to view the records of all students	3.75	0.45	Agree
<i>Student</i>				
6	The software enables student to take lesson	3.58	0.51	Agree
7	The software enables student to watch video lesson	3.50	0.67	Agree
8	The software enables student to view and download pdf files	3.58	0.51	Agree
9	The software enables student to view lecturer and course rep(representative) notices	3.33	0.49	Agree
10	The software enables student to take test based on the lesson	3.83	0.39	Agree
11	The software enables student to view his or her result	3.75	0.45	Agree
<i>Visitor</i>				
12	The software enables a visitor to view information about the College	3.33	0.65	Agree
<i>Non-Functional Software Requirements</i>				
13	The software is well organized	3.58	0.51	Agree
14	The Software window environments are attractive	3.83	0.39	Agree
15	The software buttons are responding to mouse click quickly	3.58	0.51	Agree
16	The feedback messages provided by the software are self-explanatory	3.58	0.51	Agree
17	The software has data security	3.58	0.51	Agree

18	I felt comfortable when using the software	3.58	0.51	Agree
19	It is easy to navigate to different parts of the software	3.75	0.45	Agree
Recommendation				
20	The developed software can be used for online economics instruction in the College	3.58	0.51	Agree

N =Number of respondent SD =Standard Deviation \bar{X} =Mean

The data from table 1 shows the means and standard deviations of the questionnaire items. A close look at the values of the means indicated that all the means have values not less than 2.50 which is the cut-off point. This implies that the respondents are satisfied with the performance of online economics instruction system. Another close look at the table shows that the values of the standard deviations (SD) are small, implying that the respondents' opinions on the items were very close. Finally, the mean value of item 20 (3.58) indicated that evaluators agreed that the developed online economics instruction system can be used for teaching and learning of economics courses in the College.

VII. CONCLUSION/RECOMMENDATION

Economics department is one of the largest departments in the College in terms of students' population. Furthermore, the number of lecturers in the department does not match the number of students. Hence, this resulted to overloading of lecturers in the department in terms of academic activities. To reduce lecturers' workload, the researchers designed and developed an online economics instruction. With this system on the College's web site, students can learn economics courses anytime and anywhere at their own pace, thereby reducing lecturers work load. An initial evaluation by 12 staff and students that tested the developed system confirmed the system is effective and recommended that it can be used for teaching and learning of economics courses in the College.

VIII. ACKNOWLEDGMENTS

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