

A CONVENIENT APPROACH TO LEARNING USING COMPUTER ASSISTED LEARNING APPLICATION

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ABSTRACT

Computer Assisted Learning package or e-learning package is defined as a software that is used to impart knowledge and understanding to the students through Information and Communication Technology devices such as computer networks and multimedia which are of paramount importance (Vittorio Fuccella, 2007).

This paper designed and implemented an application for a convenient way of learning using CAL. It also lists some of the limitations in the conventional classroom teaching and states the benefits of using CAL.

The methodology used in this paper span from fact-finding techniques which are observation and interview to the structured design using UML Use-Case Model. The Use Case Model captured all components in the system.

Finally, this CAL application was originally designed for a secondary students and computer studies as a subject.

Keywords: *Computer Assisted Learning, CAL, Student, Learning, personalised experience.*

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1.0 INTRODUCTION

In this present dispensation, it is obvious that all human endeavours have been computerized. This is due to the enormous benefits derived from the use of computer system. Perhaps, the reason for the requirement of computer literacy when one is competing for any skilled job today is due to the use of computer in all human endeavours. We are in the era where computers with their applications are indispensable and effective use of computer in teaching or learning would help students if integrated into the learning process.

Computer-Assisted Learning (CAL) is an interactive learning technique where a computer is used to present the instructional material and also to monitor the learning that takes place. It uses a combination of text, graphics, sound and video in enhancing the learning process. The computer is used for many purposes in the classroom, and it can be used to help student in all areas of the curriculum.

According to Brac (2013), Computer Assisted Learning (CAL) application is a program created to make the text content easier, interactive and stimulating, adding visualization. He further pin-points the advantages of CAL which includes: Moving from the teacher centred classroom to a more interactive computer system, making the class more interactive, increasing teachers' understanding of the lessons, and also to create self learning provision for both teachers and students.

This paper evaluates the advantages of CAL over the conventional classroom learning and it was designed for secondary school students in Igbesa, Ogun State, Nigeria. Computer study as a subject was used as a case-study coupled with the other subjects the students would be taken. All the courses to be taught in the curriculum are uploaded into the computer for students to read. The paper incorporated quiz along side for the students to access their performance after a topic is covered. These help students to evaluate their performance after each topic and where student's performance is not appreciative, the student goes back and re-study the topic. At the end of the quiz, the student can take a statistic evaluation of his/her ability.

1.1 AIM AND OBJECTIVES OF THE STUDY

The aim of this paper is to design and implement a new method of teaching through the use of computer, using text and graphics to aid or assist learning activities. The objectives are;

1. To use computer to assist learning.
2. To help students take charge of their own learning process.
3. To help students gain independence and personal confidence in learning.
4. To help students evaluate their performance after each learning by taking quiz.
5. To help both extroverts and slow learning to learn at their own pace.

1.2 STATEMENT OF PROBLEM

This paper tends to provide solution to some of the problem that conventional classroom is facing. From the experience of the conventional approach of doing things, coupled with the investigation and the analysis of the existing ways of teaching students, these are some of the problems associated with classroom learning.

1.2.1 Lack of Students' Concentration

There are lots of distractions in the classroom coupled with the large population of students in the class making the full attention of the students not to be guaranteed. The conventional classroom learning may not get the students' entire attention due to those distractions that is going on around them.

1.2.2 Lecturing Pace Problem

Some students are slow learners while some grasp whatsoever the teacher says easily. The slow learners hardly take charge of their own learning at their own pace in such scenario. This is a common problem facing students when using the conventional classroom system of learning. Since human beings learn at different speed and understand things different ways, there should be a way out for these slow learning students.

1.2.3 Fear of Embarrassment

The conventional classroom teaching sometimes create a fear of embarrassment to some students who are inquisitive in nature that want to ask question(s) in order to get the real understanding of the topic. The fear that he/she wouldn't know what the teacher will say makes such student to keep quiet in the class. This often occurs mostly in the class of teachers that are not friendly to students and latter lead to partial knowledge attainment for such students.

1.2.4 Teacher's Inexperience

Experience or skill comes from constant practice of an activity or doing something for a long time rather than from books. It is the years of teaching experience that dictates how effective a teacher is and also the effectiveness of his/her teaching on the students. It is obvious that students are unable to understand some subjects handled by inexperienced teachers.

1.2.5 Students' Population

Education is becoming a must for all individual and this has increased numerous the rate at which students are being admitted in schools. This tends to reduce the efficiency of the teacher because the population of students have outnumbered teacher's ability thereby making it impossible for individual students to gain his/her teacher's attention. The following are lists of other problems that make conventional classroom teaching ineffective.

- i. It is time consuming in terms of marking of student assignments, tests and even examinations.
- ii. Consumes large volume of paper work.
- v. No clear understanding of the study because of lack of pictures or images that may give more illustration.

In other to avoid all the above-listed limitations, there is need for computerization of learning system as this eliminates all these limitations.

1.3 SCOPE OF THE STUDY

This paper covers the most relevant topics in Computer Study Syllabus for Senior Secondary School Students of Igbesa High School, an area in Ogun State of Nigeria. The topics were discussed according to the knowledge level of the students. Simple English was used so that the slow learning students can understand what the lecture topics were all about. Diagrams were used where needed in other to make the learning more real.

1.5 BENEFITS OF THE COMPUTER ASSISTED LEARNING (CAL)

The benefits of CAL are numerous but some of them are itemised below.

1. Instantaneous response/immediate feedback.

2. Self pacing time- allow students to study at their own pace.
3. Helps teacher to devote more time to individual students based on their assessment.
4. It provides privacy for the shy and slow learner.
5. It provides opportunity for learning and re-learn.
6. There is facility for multimedia which helps to understand difficult concepts through multi-sensory approach.
7. Self-directed learning – students can decide when, where, and what to learn

2 LITERATURE REVIEW

Computer Assisted Learning though not new, has been widely used in many countries of the world. According to Linden, et al (2003) the (CAL) program in Vadodara utilises the advantage of both a policy put in place by the government of Gujarat in 2000 and the established infrastructure of the balsakhi program. Though, the computers given to them were not used for the purpose it was provided for but, with the help of Pratham that had previous experience with computer assisted learning the Vadodara Municipal Corporation could be able to utilise those computers.

Also, Nihtilä, et al (n.d). developed and implement a computer-based learning system used at Åbo Akademi University, in the department of Business Administration for graduate level students in Accounting and Finance.

The rate at which CAL application has been widely adopted by different countries, Institutions both Governmental, Private and even individual people who has interest in promoting and increasing learning through the use of computer and Information Communication Technology can never be over-emphasised.

Computer Assisted Learning is a program that is able to provide material to individual student according to their learning styles and curricular goals and it is useful for making complex material simpler due to the multimedia that is embedded (Leiderman, et al, 2001).

This is further emphasised by Kershaw, et al (n.d), in their paper highlighting the reasons why CAL application is almost generally acceptable. The reason being that students responded favourably to high quality, graphics, text and animation, and that their concentration spans were increased greatly, it is instructionally useful and the great benefit the design of CAL packages gives by better understanding of the specific learning, objectives, prerequisite skills and styles appropriate to different materials.

Finally, several studies which have shown that groups of students who are using CAL have better results than groups using traditional learning. Some studies even demonstrate that students using CAL needed shorter time to reach the learning objectives, achieving better final results than students who did not have access to CAL (Schitteck,et al 2001).

3 RESEARCH METHODOLOGY

The investigation concerning the development (designing) of this paper work was carried out and conducted using fact-finding techniques. The major two fact-finding techniques used were Observation and Interview.

Observation: Observation was made to check the way the students are being taught, the condition of school environment, the structure of the classroom (if it is well ventilated or not). Also, the reaction of students during lecture was also observed. All of these contributed to the information used for the development of this Computer Assisted Learning Packages.

Interview: Some teachers were interviewed including Computer studies' teacher in the school. Good responses were given to the questions that were asked. The information given enhanced the proper development of this CAL system.

Moreso, the design methodology made use of Use-Case to capture the CAL Scenario. The Use-Case Model describes the different actions that the system performs which yielded an observable result. The UML Use-Case Model/Diagram was used as the designed model that captures all the components in the system.

Content's Goals: To assist the student learn, re-learn and take quiz at their own pace using CAL so as to achieve a personalised knowledge and as well improve their skill and knowledge.

Scope: The student learns the topics chapter by chapter, take a quiz to know his/her ability and evaluate their performance by clicking on the statistic in order to increase students' knowledge and limit the shortcoming which the conventional classroom has posed on learning.

Actors: Student and Administrator

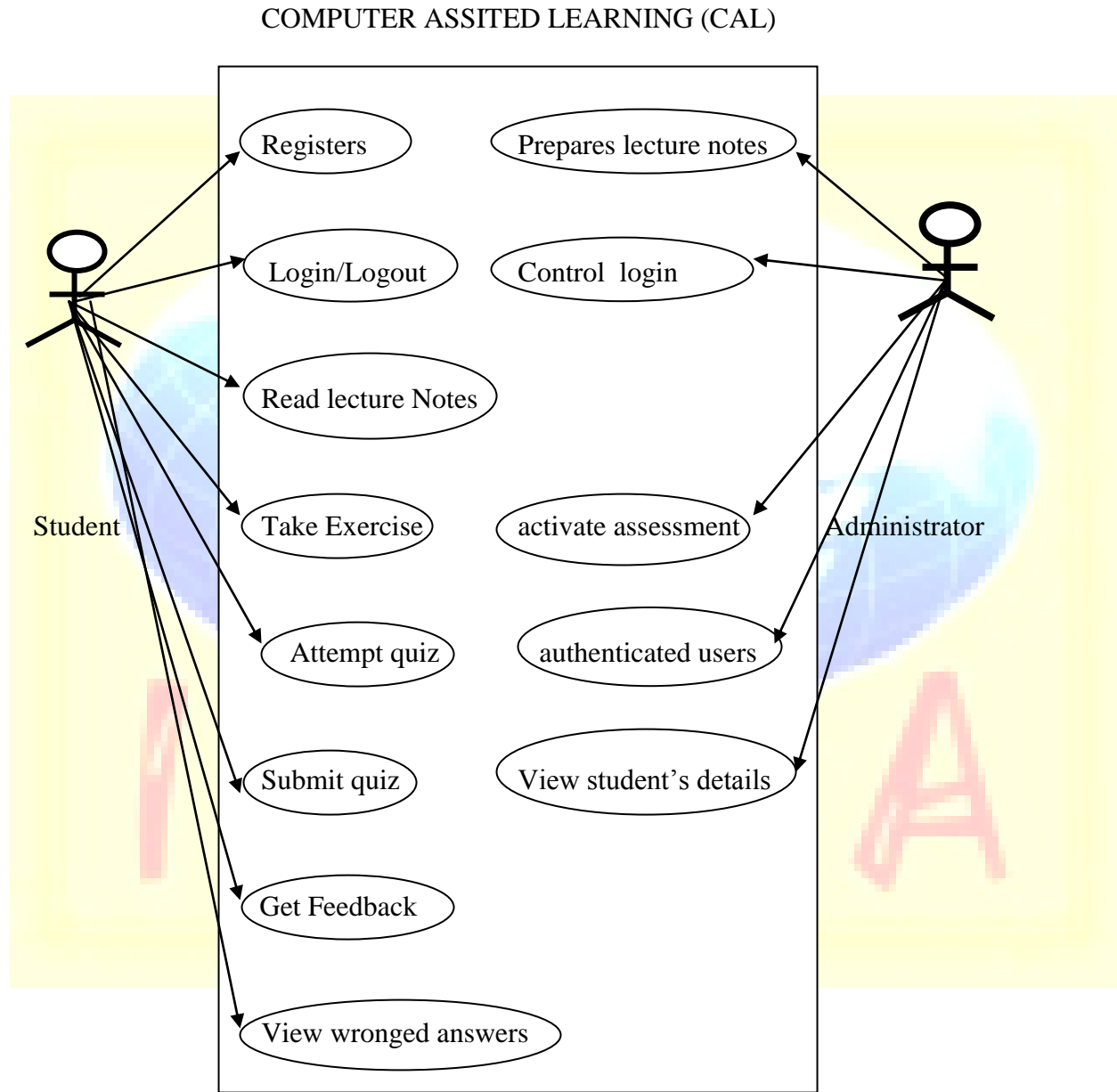


Figure 3.1 Use Case Diagram for Computer Assisted Learning

The Student performs the following functions in CAL Application.

Register: Student Registers by clicking on “Create New Account” which enables such a student to register his/her data in the User Account Form.

LogIn/LogOut: The students Login with his/her Username and password in order to learn a topic, take tutorial and take a quiz and once he/she is through with the lecture, he/she Logout.

Read Lecture Notes: This component allows the student to read the lecture notes.

Take Exercise: At the end of each chapter, there is an exercise for the student to take in order to ascertain the level of assimilation of the lecture note taken.

Attempt Quiz: The component allows student to take quiz at the end of each chapter. The student will click on ‘take Quiz’ and the computer displays the questions.

Submit Quiz: Student Submits quiz by clicking on Finish. And, any question(s) left blank were revisited before the submission. If not, the student will not be graded.

Get Feedback: Once a quiz is submitted, the system grades and the result is displayed.

View Wrong Answers: The questions answered wrongly were displayed along side with the right answers.

The Administrator who is the second actor in the system performs these functions:

Prepares Lecture Notes: The administrator prepares the lecture notes that the students use for learning.

Control Login: The administrator controls student’s login by block or unblock the student for reading lecture notes.

Activate Assessment: The administrator makes the lecture notes, exercise available, and enables the quiz for the students.

Authenticate Users: The Administrator is able to view student detail like List of all Registered Student by clicking on User management, click on User and click on All, and the Student’s Statistic by click on Statistic and then click on the revision.

View Student’s Detail: The Administrator is capable of checking the students’ details and able to evaluate students’ performance based on their records.

4.0 IMPLEMENTATION AND DICUSSION

Implementation is the process of executing the program with the intent of finding errors and missing operations and also a complete verification to determine whether the objectives are met and the user requirements are satisfied. The ultimate aim in implementation is quality assurance.

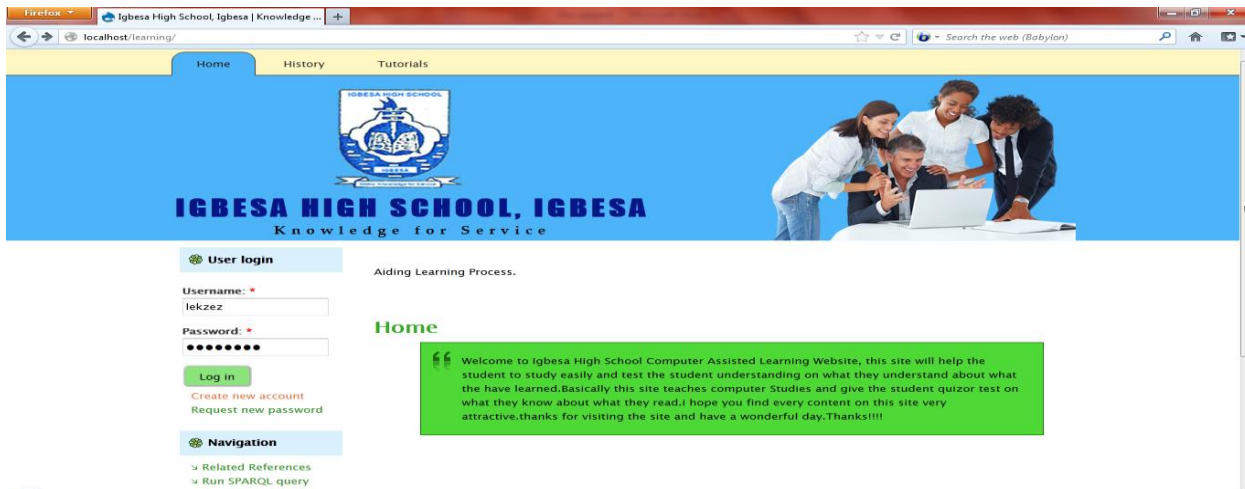
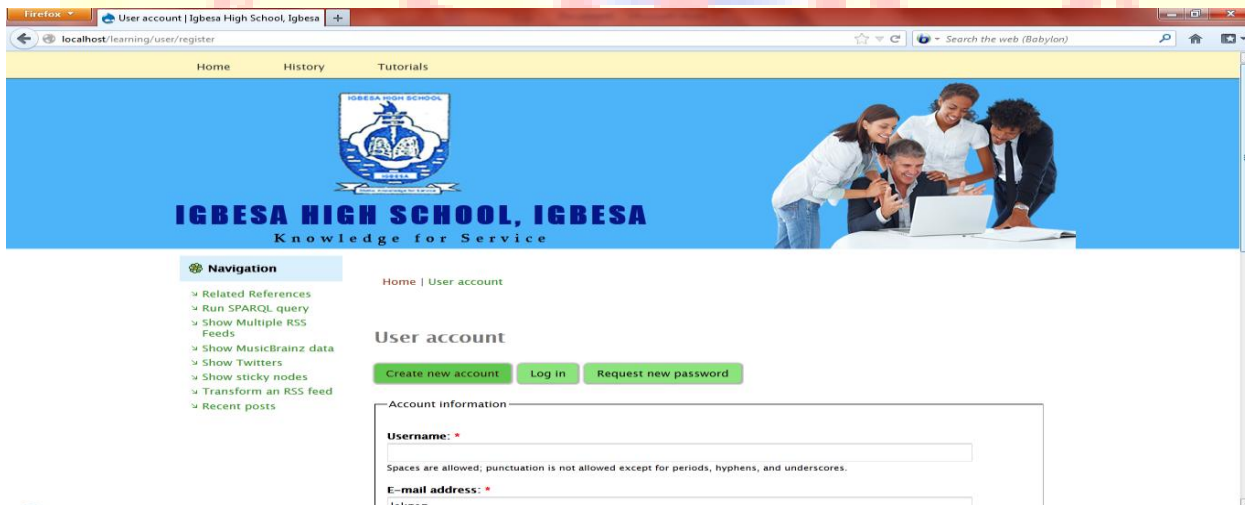


Fig 4.1 Website Home page.

This is the site Home Page where students are to register by clicking on 'Create new Account'. After clicking on it, it takes them to the Profile page where all data are entered.



Student Information

Surname:

Enter your Surname

First Name:

Other Names:

Attendance Number:

Class:

[Create new account](#)

Fig 4.2 New User Registration Page

New User Registration Page allows new students to register in order to have access to the Lecture note and to be able to take assesment for self-evaluation.



Fig 4.3 Tutorial Page

This page allows the student to click on his/her choiced subject that he/she wants to study or learn. It is the pages where all the subjects are listed and students is expected to click on the subject he/she may like to study.



Fig 4.4 Overview of the Chapters

After a student as registered and the Administrator has unblocked such student, the student can proceed to the Tutorial Page by clicking on the subject he/she may like to study (tutorial). But, it is only Computer Studies’s subject that is populated with data because it is only the subject of our concern.

- Show sticky nodes
- Transform an RSS feed
- Create content
- Recent posts
- Administrator
- Log out

Chapter 1

Fri, 2012-09-28 22:49 | lekzez

1.1 OVERVIEW OF COMPUTER

A computer is a general purpose device that can be programmed to carry out a finite set of arithmetic or logical operations. Since a sequence of operations can be readily changed, the computer can solve more than one kind of problem.

Conventionally, a computer consists of at least one processing element, typically a central processing unit (CPU) and some form of memory. The processing element carries out arithmetic and logic operations, and a sequencing and control unit that can change the order of operations based on stored information. Peripheral devices allow information to be retrieved from an external source, and the result of operations saved and retrieved.

The first electronic digital computers were developed between 1940 and 1945 in the United Kingdom and United States. Originally they were the size of a large room, consuming as much power as several hundred modern personal computers (PCs). In this era mechanical analog computers were used for military applications.

Modern computers based on integrated circuits are millions to billions of times more capable than the early

Fig 4.5 Overview of the Course Content

This page provides the student with the lecture note in Chapter One which includes topics like Overview of Computer etc., at the end of the chapter, the student is provided with a review question that enables the student to test his/her knowledge on the chapter.

The screenshot shows a web browser window with the following content:

- Browser Tabs:** Chapter 1 | Igbesa High School, Igbesa; Arrow - S01E12 - Vertigo from Arrow...
- Address Bar:** localhost/learning/node/8/take
- Page Header:** IGBESA HIGH SCHOOL, IGBESA Knowledge for Service
- Navigation:** Home | Chapter 1; View, Take, Edit, Manage questions, Outline, Revisions, Track, Results; Statistics
- Message:** You have already passed this Assessment.
- Question:** Question 1 of 4; Time left: 00:14:32; Computer system can be classified based on?
- Options:**
 - Based on type only.
 - Based on function only.
 - Based on size only.
 - Based on type, function, size.
- Buttons:** Next

Fig. 4.6 Assessment Page

This page allows students to take a quiz on the chapter. On each chapter, 5 questions were prepared as a quiz for the students to take, and at the end of the quiz, the student submit the quiz by clicking on Finish.

View Take Edit Manage questions Outline Revisions Track Results
Statistics

You got 20 of 50 possible points.
Your score: 40%

Chapter One Completed

Fair Result try to read through the chapter and retake the assessment!!!

Question Results

Question: Score 10 of 10
Computer system can be classified based on?

Response:

<input type="checkbox"/>	Based on type only.
<input type="checkbox"/>	Based on function only.
<input type="checkbox"/>	Based on size only.

Question: Score 10 of 10
what is a computer system?

Response:

<input type="checkbox"/>	computer is a machine that is use for keeping money
<input type="checkbox"/>	A computer is an electronic device that performs function of playing songs alone
<input type="checkbox"/>	computer is a device that is used for watching films and listening to sooting sound.
<input checked="" type="checkbox"/>	A Computer is an electronic device that accepts data as input, processes it, and gives the required information as output.

Question: Score 0 of 10
The most expensive, largest and the most quickest or speedy computer are called what?

Response:

<input checked="" type="checkbox"/>	Micro Computer.
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Fig 4.7 Assessment Result Page.

This page displays the student result along side with the question(s) got wrong during the assessment.

4.1 SYSTEM REQUIREMENT

This consists of Hardware Requirement and Software Requirement. The Software requirement includes the software that should be available in the Local Server, Internet Server and the Client.

Hardware requirement: the general hardware requirement for the Local Server, Internet Server and the Client include; Switch, Router/Wireless Access Point, Straight-through Cable, Intel Pentium IV, 2.0GHz of Processor, 1.0GB of RAM, 40GB of Hard Disk,

Software for Local Server: This includes Operating System which is Windows, Apache Server, MySQL Database, PhP, called(X.A.M.P), Internet Browser like Mozilla Firefox.

Internet Server: This includes Domain Registration and Space from the internet, FTP Client Software for easy file uploading, Internet Browser like Mozilla Firefox.

Client: The client computer must have Windows O.S, Internet Browser Mozilla Firefox, and Adobe Flash Player Plug In.

4.2 CAL SYSTEM COMPONENTS

These components follow according to the general and popular word XAMP which is an acronym for;

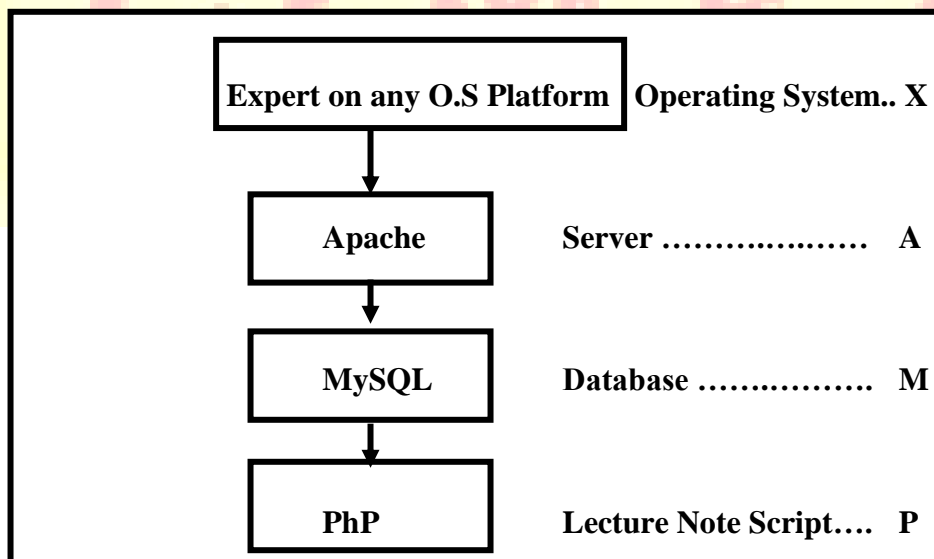


Fig. 4.2.1 CAL System Components**5.0 SUMMARY AND CONCLUSION****5.1 SUMMARY**

The main objective of this paper is to assist students to learn their various subjects easily and especially computer studies that this application was designed for. The Computer Assisted Learning Application tests the students' knowledge by giving assessment at the end of each chapter from which they choose the best option to the question displayed. Moreover, the assessment provided coupled with the statistic's displayed of student's performance go a long way to assist students to have a personalized experience on that very subject. This paper does not intend to under-emphasized the role of teachers/lecturers in the conventional classroom learning but, to emphasize the assistant ease, re-directed learning, convenience and lots more that the CAL application provides for both teachers and students.

5.2 CONCLUSION

Considering the objectives of this paper coupled with the methodology used, it is assumed that CAL can be adopted even, in all other subjects in the Secondary School as much as those teaching notes follow the points to be considered when designing CAL / CAT Systems which are; Clarity, Simplicity, Maintainability, and Robustness. (Nihtilä, et al n.d.) and are written in the level of students' assimilation where big grammars or confusing terms are eliminated. Computer Assisted Learning package on Computer Studies or other subjects would assist in making students computer literate and hence, increase the rate of students studying Computer Science in the higher Institutions, making student technologically inclined and aspire to be good innovators .

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