DESIGN AND IMPLEMENTATION OF LEARNING-AIDED SOFTWARE FOR CHILDREN

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Abstract

This project is the design and implementation of learning-aided software in English language and the three basic languages we have in Nigeria (i.e. Yoruba, Igbo and Hausa Languages). This Project teaches and enlightens the pupils on an educational platform where they can learn in the languages listed above and have fun while learning as well.

Keywords: CAL (Computer Aided Learning) Software, Nigerian Languages (Yoruba, Igbo, Hausa), Information and Communication Technology, E-Learning, Computer Systems, Children.

1 INTRODUCTION

The introduction of Information Technology to education has been of great impact globally as its importance cannot be ignored. Educational Technology is the practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources. In the past decade, Computer Aided Learning (CAL) has been a term of increasing significance; it can also be referred to as Computer Based Instruction (CBI), Computer Aided Learning (CAL), or Computer Aided Instruction (CAI). [1] Since computers were introduced into education, it has made impartation of knowledge an easy task for teachers. The use of technology in the educational sector has therefore made the process of learning and knowledge sharing an interactive and enjoyable activity [2].

Although verbal forms of teaching have long dominated education, there is encouraging evidence that the learning process and student assimilation can be enhanced by the introduction of multimedia forms of teaching [3][4]. The keyword for understanding CAL is “interaction”. Teaching today’s students requires communicating with them and keeping their attention while they live their lives in high gear, with access to music, video, and friends on demand. [5] E-Learning can be described as the acquisition of knowledge through the use of an electronic device (A Computer system in this case) that interacts with the user and guides the user through series of questions and answers, and other forms of learning procedures as well. Thanks to this modern development, learning has become a fun experience. Learning aids are also materials that can help the learner absorb knowledge by seeing and doing more than just listening to the teacher and staring at the board. With the introduction of Computers, Software programs which provide learning materials, technology has changed education to a noticeably large extent. [6] “How you use technology in education is more important than if you use it at all.” [7] New skills and knowledge have a better chance of sticking to a child’s memory if what they learn can be practiced computer-wise, otherwise, they may lose interest in learning. This software has been constructed to not only educate kids, but to also make it a fun process as well.

Many authors use the term „Edutainment“ to describe educational software that has an entertainment element. Thus, software whose main purpose is to educate would be called „educational software“ in our classification, even if it includes games and other entertainment. Many educational software products are produced to support the „home learning“ activities that are a feature of the education system in the developed world.

2 SIGNIFICANCE OF STUDY

It has been observed that most children in this present generation do not know how to interact in their mother tongue but can do so in English language. The main purpose of this project is to create an avenue whereby the mind of a child is spurred to develop interest in Local languages such as Igbo, Yoruba, and Hausa. The standard and quality of education services in our institutions can be improved greatly by providing Information Technology resources such as computer systems,

stable power supply, etc. This project would help improve computer literacy amongst students and bring about the following advantages in our schools:

- To enable children learn Yoruba, Igbo, and Hausa while they are still young.
- Creation of Information Technology awareness in the students from an early age.
- Promotion of Computer Literacy amongst students.
- Different number of students can have access to the same resources at the same time.
- A user friendly interface.
- Users can have access to information on the software anytime, anywhere provided it is installed already on their system.

3 METHODOLOGY

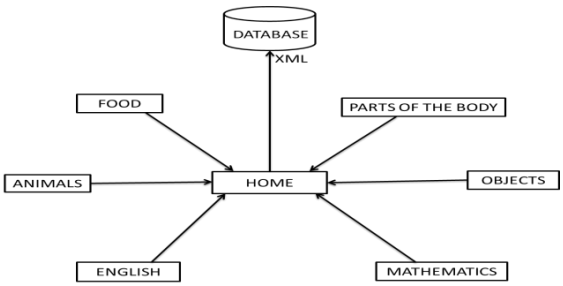


Fig. 1 Diagram depicting the home interface of the learning aid.

This project is targeted at educating beginners about Yoruba, Igbo and Hausa Languages. It entails working with software and language scripts.

Adobe Photoshop software was used in designing the display and the layout of the pages in order to make it look colourful and eye-catching. Adobe Photoshop is a graphics editing program developed and published by Adobe Systems. [8] It has features such as 3D image creation, motion graphics editing. [9]

For the database, XML would be used. XML stands for Extensible Markup Language. It is a mark-up language that defines a set of rules for encoding documents in a format that is readable to both machines and humans. [10] XML was designed for data carrying and not display. [11]

Flash Action script 2.0 is an object oriented programming language allowing far more control and code reusability when building complex Flash applications. It is going to be used for the main aspect of the project i.e. the contents of the software and how the contents of the software would be presented to someone operating it.

Adobe Flash Player Adobe Flash is an awesome program that creates movies, games, presentations, and almost anything else. It combines a paint program, a movie editor, and a programming language to make a great program. It can be used in viewing multimedia, executing Rich Internet Applications, streaming video and audio content created on the Adobe Flash platform. Flash Player can run from a web browser (as a browser plug-in), supported mobile devices, directly on an operating system intended both for regular users and content developers, (Standalone).

4 REVIEW OF LITERATURE

Computer aided learning has a tradition that can be dated back to as far as the 50‟s. Boredom is inevitable when Students have to sit in a classroom for hours. Learning aids provide a welcome break for students who have been sitting for a while and listening to an instructor lecture in front of the room. There are now various forms of learning aids that teachers can use to pique the interest of students other than textbooks and exercise books. However, it has been widely acknowledged that the integration of Information and Communication Technologies into the education sector has great potential.

The term Computer aided Learning refers to computer based packages which aim to provide interactive instruction in a specific subject area. There has been a growing interest and an increase in the popularity in the use of Computer systems in educational settings. The implementation of computers in elementary schools can serve as both teaching and learning aid and would also help to develop computer literacy amongst the children. The introduction of Computer aided learning has brought about an enhancement in the present teaching- learning process, making it interesting, exciting, mind-stimulating and easy to understand. Computer aided learning bring about an improvement in the quality of education as teachers would be better equipped to explain topics better with the help of Multimedia contents. The learning of Languages with the aid of a computer provides the basic technology for acquisition of skills in the said language. According to [12] language is regarded as the most valuable single possession of the human race, hence it is essential that a computer aided language learning system has the ability to adapt its behaviour to the goals, interests of the user. [13] Basically, language learning strategies seek to enhance student's autonomy and control over the learning process. [14] The applications of computer-mediated communication and communities, multimedia, internet based support for individual all have the potential for educational improvements.[15]

4.1 History of learning aids

Learning aids illustrate key points in lessons and rouse students' interests. The use of learning aids dates back to as early as 150 B.C. with the Greeks. Visual, aural and technological aids evolved over time. Using a variety of learning aids allows students to learn on many different levels.

1) Globes: Globes were among the first teaching aids used in ancient Greece. According to Bookrags.com, "The ancient Greeks realized that the earth was spherical and are known to have used globes as early as 150 B.C." Another early learning aid which was used in English Schools (and later in colonial America) from the mid-1400s through the early nineteenth century," was the hornbook," Bookrags.com says. The hornbook was a flat board with paper pasted to it, and "a transparent piece of horn covered the paper to protect it." The blackboard evolved from the hornbook.[16]

2) Visual Aids: The blackboard changed education in 1801 because "teaching could be a tedious and challenging business for American teachers before the chalkboard was a teaching tool," according to Ergoindemand.com. Examples of other visual aids include models, drawings, specimens, blackboards, bulletin boards, flannel boards, magnetic boards, dry-erase boards, overhead transparencies, photographs and slides.

3) Aural Aids: One of the most essential parts of learning is listening. Radio and television entered the classroom after World War II." Although instructional radio failed in the 1930s, instructional television was viewed with new hope (in the 1940s)," Michael Jeffries says in "The History of Distance Education." Film was created in the early 1900s, but it "came into widespread classroom use in the 1940s and 1950s." Cassette tape recordings emerged to assist in teaching foreign languages in the 1960s. Today, "students can watch educational broadcasts to closed-circuit lectures on cable or satellite television; they can also view instructional videotapes and (DVDs)

As time went on, in the 80"s, educational instructors began to notice the importance of computers as a result of its inbuilt productivity tools such as spread sheets, word processing, databases, desktop publishing, graphics and design, etc. As at the 90"s when the evolvement of computer systems and the Internet came about, the nature of education changed. Virtual Classrooms, online learning, etc. have long since dominated the role of technologies in educational institutions.[17] In the 20th Century, educational technologies evolved into multimedia (projectors, radio, motion pictures)[17] Information was recorded in technology (e.g. audio, video) and the technology passed on the information to the students. It was left to the students to digest the information presented by the technology.

4.2 Advantages of computer aided learning

- Computer aided learning remains a good way to assimilate and retain information. It helps to improve the active participation of the students, which contrasts with the passivity of reading a textbook, thereby making recollection easier.
- Learners are exposed faster to practice and evidence.
- It provides the students with instant feedback, and a clear view of the level of progress made so that they can know where improvements need to be made.

- Computer aided learning enhances the thinking capability, logical reasoning, and decision-making abilities of the students.
- Visual aids are key tools in learning and development since they help increase a student's interest in a subject.
- Learning aids improves the quality of education in today's schools while also providing students with the sense of excitement they desire.
- Error Analysis: the computer database can be used to classify and differentiate errors made by the students.
- A computer can detect specifically the mistakes students have made, and can make corrections (if programmed to do so), thereby enabling the students to make self-correction and understand the reasons and the principles behind the correction [18] [19].

4.3 Disadvantages of computer aided learning

- There are real costs associated with the development and implementation of computer aided learning in institutions.
- Not all teachers are computer literate; hence, training them to make use of computers in education could be quite difficult. Some might perceive it as a threat to their job. [20] Computer learning aids challenge the traditional educational methods [21][22] and may not fulfil the expectation of some institutions as the methods and Objectives of the package may differ from the syllabus of the institution.
- Computers work with the GIGO (Garbage In, Garbage Out) principle, therefore it would not be able to deal with unexpected situations.
- Young pupils (elementary school) may not have developed adequate mental abilities to push for the self-control required by the use of Computers. [23] [24]
- For soft wares with games in them, the games are most likely going to be viewed as purely a source of entertainment rather than educational advancement. [25]

4.4 Requirement analysis and design

The system requirement is a statement of the service a system is expected to provide and the constraints under which it must operate. It defines the features of the system or a description of something the system is capable of doing in order to achieve its purpose. The following are the requirements of the system:

- Educate children on the fundamentals of learning.
- Create language awareness in children from an early age.
- Ensures accessibility of information.

4.5 Application tools used

1) Flash action-script 2.0: When the need for adding interactivity to Flash applications come up, Action- Script is the language for you. It doesn't matter if the applications are simple or complex SWF files. It isn't always necessary to use Action Script alongside Flash, but if you are working with movie-clips and buttons or objects that are not inbuilt in Flash, or if you want to turn a SWF file into a more robust user experience, then you should use Action-Script. [27]. Action Script is the programming language for Flash. Action-Script

1 is outdated and Action-Script 3 is a little bit complex especially when dealing with a simple project.

2) Adobe flash player: Flash Player was created by Macromedia and now developed and distributed by Adobe Systems after its acquisition. The Adobe Flash Player is a software that can be used in viewing multimedia, executing Rich Internet Applications, streaming video and audio content created on the Adobe Flash platform. Flash Player can run from a web browser (as a browser plug-in), supported mobile devices, directly on an operating system intended both for regular users and content developers, (Standalone). Adobe Flash Player is the standard for delivering high-impact, rich Web content. Designs, animation, and application user interfaces are deployed immediately across all browsers and platforms, attracting and engaging users with a rich Web experience.[28] Flash Player runs SWF files that can be created by the Adobe Flash Professional

authoring tool, by Adobe Flex or by a number of other Macromedia and third party tools. Adobe® Flash® Player is the software that allows computers to play multimedia content contained in SWF (pronounced “swiff”) files, which are the main type of file used by Flash Player. This content can be created by Adobe Flash Professional, Adobe Flex Builde, or other tools that output the SWF file format. SWF content can range from simple animations to online advertisements to complete applications that communicate over the Internet. In Flash Professional, designers and developers create FLA files that contain graphical elements, a timeline, and Action-Script code. Both Action-Script 2.0 and Action-Script 3.0 are supported. FLA files are compiled into SWF files. It supports vector and raster graphics, 3D graphics, an embedded scripting language called Action-Script. Flash Player has a wide user base, with over 90% penetration on internet connected personal computers, and is a common format for games, animations, and GUI‟s embedded into web pages. Action-Script 2.0 supports XML data transfer.

3) XML: XML stands for eXtensible Markup Language. XML is designed to transport and store data. XML allows learning content to be labelled in detail thereby making it possible to customize e-learning content. This detailed labelling of web page content also allows for more accurate searches. The technology is on the path to replace HTML as the standard Web authoring language and is already being used by some e-learning providers as a means of providing on the fly customization of content. Additionally, if authoring-system vendors and courseware providers were to adopt XML as a standard, the need for third party browser plug-ins (i.e Shockwave) would be eliminated. XML extends the advantages of inter- operability even further by both integrating content and tracking learner progress across several different providers. Finally, XML‟s richer language allows for more interactive content than HTML, which leads to a more engaging experience for e-learners, and may ultimately make e-learning more commercially viable. XML is expected to radically transform the internet in general and e=learning in particular upon adoption of standards by the World Wide Web Consortium. XML is seen as a key technology for tying learning to knowledge management.

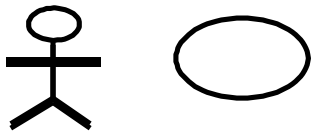
4.6 Unified modelling language

Unified Modelling Language is a set of modelling convention used in describing or specifying a software system in terms of objects. UML is a visual language for specifying, constructing, and documenting the artefacts of software-intensive systems. UML is not a development method by itself, It can be used with all processes, throughout the software development life cycle, and across different implementation technologies.[29] Complex software designs difficult for you to describe with text alone can readily be conveyed through diagrams using UML. [30] However, in this project, Unified Modelling Language would be used in defining the components used in building the system and the interfaces that would connect the components. In UML, there are two basic categories of diagrams: [31]

- Structural (or Static) Diagram: emphasizes the static structure of the system using objects, attributes, operations and relationships. The structural view includes class diagrams and composite structure diagrams.
- Behavioural (or Dynamic) Diagram: emphasizes the dynamic behavior of the system by showing collaborations among objects and changes to the internal states of objects. This view includes sequence diagrams, activity diagrams and state machine diagrams

Every UML diagram belongs to one these two diagram categories. The purpose of structure diagrams is to show the static structure of the system being modelled. They include the class, component, and or object diagrams. Behavioural diagrams, on the other hand, show the dynamic behaviour between the objects in the system, including things like their methods, collaborations, and activities. Example of behaviour diagrams are use case diagrams, activity diagrams and sequence diagrams.

1) Use Case Diagram: UML use case diagrams can be used in describing the main processes in a system, the interactivity between the main processes (use cases) and external individuals called “actors” [32] An Actor is anything that communicates with the product that is external to itself.



Actor Process

Fig. 2. Diagram showing the components of a use-case diagram

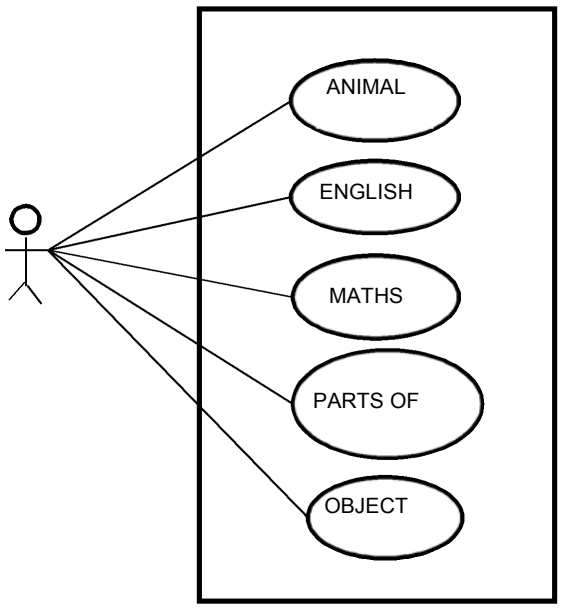


Fig. 3. Use-case diagram showing the top-categories of the software

5 CONCLUSION

In conclusion, this project has achieved its aim of producing an interactive software which would be used as a platform to impact the knowledge of our local languages (Yoruba Language, Igbo Language and Hausa Language) to our children at a young age. This project would in its own way increase the level of interest in the local languages mentioned and also would make it possible for the languages not to go totally extinct in the future.

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