Designing a Novel Offline Interactive Tool For Beyond Classroom Learning

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Abstract— In present context Education Technology has extended beyond the four walls of classroom to create maximum impact on the student knowledge base. In this regard interactive tool has created new dimensions in Educational Technology. Several online interactive tools are available to reach the learner effectively. But yet 'Free Internet' could not be achieved in the developing nations like India, Bangladesh and other; and thus maximum outreach of this online interactive tool couldn't be achieved effectively. We propose here in this context an offline Interactive tool to reach all the learners who have limited access to Internet. On the other hand 8085 microprocessor is one of the bases of Electrical, Electronics, Computer, IT engineering for both UG/PG studies. This is why the authors here opted to design Offline Interactive Tool for 8085 microprocessor in order to achieve beyond classroom learning

Index Terms— Audio- visual Learning, Offline Interactive Tool, Virtual classroom, Plug and Play mode,8085 Microprocessor Beyond classroom Learning, Educational Technology

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1 INTRODUCTION

The word 'technology' is a Greek word that resembles systematic treatment. Simultaneously Educational technology is a systematic and innovative approach for learning. Educationist Richey defined educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" [1]. More convincingly, it is a technological problem solving tool kit initiating Learner's progress and combines the implementation of appropriate tools, techniques or processes that enhance the teaching practices in a modest way. Few inbound merits of this technology are – cognitive transition from classroom teaching to virtual classroom teaching, an energetic as well as interactive learning session beyond blackboard-chalk-duster,to impart knowledge at anytime anywhere out of physical classroom environment to all learners. Thus Educational Technology is pivotal in designing modern education systems. One substantial element of educational technology is ICT tool [2].

ICT resembles 'Information and communication technologies' or elaborately it is a device - rich of resources and information to communicate with computers, telephony, television etc. Basically this tool is based on internet oriented e-learning i.e. learner may learn their respective sessions through web-based or by chat, e-mail etc. In other words it is an on-line classroom where knowledge is imparted [3].

The solitary aspire of our proposed offline interactive tool is to build 'technology enhancement' learning tool to facilitate learners to learn beyond the four walls of the classroom [4]. But the frajility is that 24 hours access to internet is quite expensive in developing nations [5]. This demotivates the incorporation of ICT tool in present education system [6]. Authors here an offline interactive tool. On the other hand 8085 is ubicausious in the periphery of computer, electrical and electronics engineering [7]. Thus our offline interactive tool is intended to 8085 microprocessor learning and the novelty is it is plug and playmode operation [8].

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2 OFFLINEINTERACTIVE TOOL

It includes study materials (PDF, PPT, DOC files) of 8085 microprocessor.Important, relevant and technically efficient videos are compiled in a retrospective mode. Amid all videos are simple and easy to understand. Full Instruction Set of 8085 is compiled here. This also includes offline self-testmodule so that a learner can asses his knowledge base on selected.Some commonand predefined microprocessor programs are also covered for extensive practice sessions.

Apperantly flowchart making tool is to be provided to the learners in order to facilitate the learner as per program requirement. The most promising element is the user friendly and easy to use Simulator to simulate the 8085 based programs without physically doing present in a lab. Thus it replaces the physical Lab virtually and it is totally offline based.

3 PROCESS TO GO THROUGH

As this an offline interective tool the following course of action are to the incorporated in time before making it available to the learners.

3.1 Case study

Here stipulated amount of analytical and empirical based surveysare made available. Based on this a compact tool is modeled comprising of many individual components.

3.2 Model Design

Model designing is the planning or designing of the tool.From the very inception, the members here motivated themselves in designing the framework as described in the following. With the incorporation of frames the entire topic of 8085 microprocessor is categorized into several modules or blocks.

3.2.1 Block Based Tool diagram

- ➢ The tool is developed on platform independent, freeware and open source platform.
- ➢ The first window will contain a start button and clicking the button the MAINwindow will appear.

Block_1: The customary of this module is to enrich the learner with 8085 knowledge. The module consists of possible all kinds of Study materials.

Block_2: The entire instruction set of 8085 is loaded in this module.

Block_3: A set of assignments along with few worked out problems or programs is made available to the learner here in this module.

Block_4: This module is a predefined test bench for analytical and reasoning based learning. Self MCQ test is included here.

Block_5: Module_5 is interconnected to module_3.As module_3 indicates several assignments thus it obviously requires flowchart.Module_5 is captivated with several flowcharts comprising of all possible operations with the best of the knowledge of the authors. Furthermore, user can select assignments from module_3 and use the flowchart designing tool and design the flowchart for the given assignment and subsequently compare it with any of the similar flowchart accumulated in module_5.Module_5 also provide a scope to rectify the drawbacks of the flowchart by comparing his own with the given flowcharts on files.

Block_6: After successful implementation of the block_5, block_6 gives the space to the programmer to write the program using program pad. Basically, this establishes the idea of "Virtual Lab Based Experiments Using 8085" [9].

Block_7: In this block, timing diagram of the program is included so that the time period required by the program until its final execution can be visualised.

The outer most block is a compact view of all the above subjected modules in an assimilated way. This keeps greater trade off amid all the modules and an effectual linkage is attributed to categorically demonstrate the perfect learning and hands on experience on 8085[10].
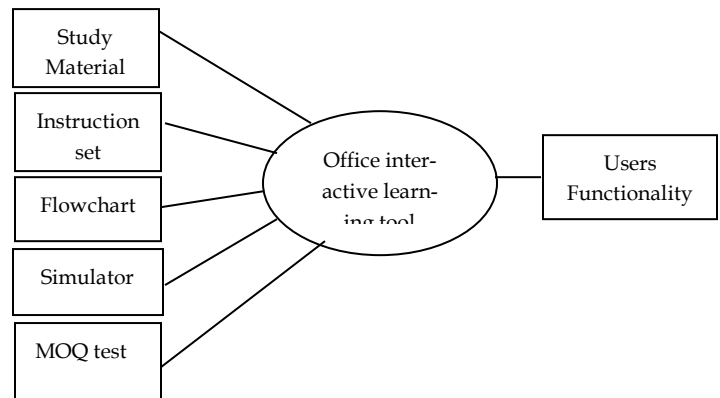

Fig 1: Block Design

3.3 Snapshot

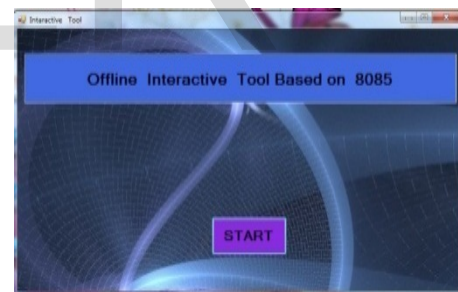Few snapshots of our proposed offline tool is presented here in the figures below.
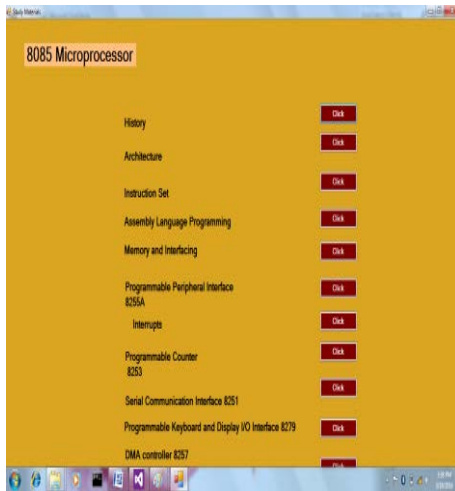

Fig 2: Opening Screen

Fig 3: Application

Fig 4: Topic Screen

Fig 5: Study Zone Screen

3.4 Data Flow Diagram of the Proposed Tool

The flow of control is incorporated here in this section of the tool. It illustrates how data flows effectively from input to output. It explains the modous operandi of the tool in a concise way and indicates how dataflow in a system from one process to another is corroborated here. This structured diagrammatic technique represents external entities, logical storage, data sinks and data flows in the offline tool.

3.5 Entity Relationship Diagram of the Proposed Tool

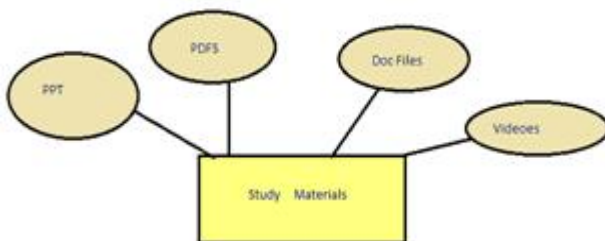It represents the relation between all the entity of the tool and their attributes synchronously.

Fig 6: ERD of the proposed offline tool

3.6 Database Management System Designing of the Tool

In this tool numeroustopic wisePDFs, PPTs, DOC files, Videoesare being stored. For effective coordination many DBMS supportives such as Oracle, Sql Server etc. are being relied upon by the authors to achieve linearity. Applying theDBMS data will be stored in the 'Study Zone'.

3.7 Language Selection

The authors used java programming language to implement the offline interactive tool.

3.8 Testing

After designing the software tool few tests are to be made including white Box and black box are require to verify the trustiness of the tool.

3.9 Installation

Last but not least the authors need to create the .exe file after executing all the above process and testing all the conditions. Then only thesoftware is ready for installation.

4 EXPECTED OUTCOME

Summing the total the authors anticipate the following outcomes of the proposed tool. (i) To design high interactive tool based on audio-visual learning for 8085 microprocessor. (ii)To design a learning process that is 'independent to online coordinators or the availability of net'. (iii)To design high efficient easy communicative learning tool that presents the finest state of art for classroom learning.(iv)To design easy, portable, flexible, straight forward and simple 'plug in and play mode' learning tool' for the student of all expertise. (v)To design a sophisticated learning tool that expands from the boundary of classroom.(vi) To design and simulate programs, flowcharts, simulations and timing diagrams in a versatile way without compromising the flexibility of learner. (vii) To access the knowledge base of 8085 of the learner in using 'MCQ' in the given platform of the learning tool. (viii) To effectively reduce the cost of the state of the art of learning 8085 for all classes of learner.

5 CONCLUSION

To amplify the goodliness of classroom oriented learning is manufasted by the newly coined term Education Technology. Here, ICT tools are primitive composite of modern integrated learning. The only pitfall is that in developing nations ICT tool faces the dead lock of 'not free intrnet or cheap 24X7 hour internet facilities'. The authors hereby vimdicts the incorporation of offline plug & play mode interactive learning beside ICT tool based learning.In order to materialize the same the authors are developing systematic & synchronized plug & play mode offline interective tool for 8085 Microprocessor learning. Few considerable developments are reported here in this documentation. The author only intend to rationalized the incorporation of plug & play mode offline interective tool in complex technological learning

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REFERENCES

[1] Richey, R.C. (2008). "Reflections on the 2008 AECT Definitions of the Field".TechTrends 52 (1): 24–25. Doi: 10.1007/s11528-008-0108-2.

[2] I. Zelenika and J. M. Pearce, "The Internet and other ICTs as Tools and Catalysts for Sustainable Development: Innovation for 21st Century", Information Development Volume 29 Issue 3 August 2013 pp. 217 – 232. DOI: http://dx.doi.org/10.1177/0266666912465742.

[3] C. Perez, "Technological Revolutions, Paradigm Shifts and Socio-Institutional Change" in E. Reinert, Globalization, Economic Development and Inequality: An alternative Perspective, Cheltenham: Edward Elgar, 2004, pp. 217-242.

[4] Martin Hilbert,"Big Data for Development: From Information-to Knowledge Societies", SSRN Scholarly Paper No. ID 2205145. Rochester, NY: Social Science Research Network, 2013; http://papers.ssrn.com/abstract=2205145.

[5] Reddi, Usha Rani Vyasulu. "Primer 1: An Introduction to ICT for Development", United Nations-Asian and Pacific Training Centre for Information and Communication Technology for Development. Retrieved 13 October 2015; http://unapcict.org

[6] P. Bala, R.W. Harris, P. Songan, E. Khoo,"Challenges and Opportunities in Introducing Information and Communication Technologies to the Kelabit Community of North Central Borneo". New Media and Society, 2001, 3(3), pp. 271-296.

[7] S. Batchelor, S. Evangelista, S. Hearn, M. Pierce, S. Sugden, M. Webb,"ICT for Development Contributing to the Millenium Development Goals: Lessons Learned from Seventeen infoDev Projects", November 2003, World Bank.

[8] W.D. Breingan, M.M. Chen and T.E. Gallen,"The Laboratory Investigation of a Digital System for the protection of Transmission Lines", IEEE. Transaction on power Apparatus and System. Vol. PAS 98, No. 2, March/April 1979.

[9] T. C. Bartee, "Digital Computers Fundamentals", 6th Edition, McGraw Hill, 1985.

[10] Bary B. Bray, "The Intel Microprocessor",6th Edition, PHI, 2003.