EduScope – *A New Learning System*

Ambreen Sheikh
Center of Research in Networks and Telecommunications.
Muhammad Ali Jinnah University.
Islamabad, Pakistan.
anbreen@corenet.org.pk

Dr. Amir Qayyum
Center of Research in Networks and Telecommunications.
Muhammad Ali Jinnah University,
Islamabad, Pakistan
aqayyum@ieee.org

Abstract---- **Pakistan is a country of varied culture and people. One can find people on extreme ends of social set-ups. People who enjoy a lavish life and at the same time people who are living below the poverty line. When it comes to children, we all want them to have the best of everything, but unfortunately due to the financial imbalance in the society many under privileged children who are intelligent, bright and motivated are not able to excel due to the lack of facilities.**
The learning system presented in this paper is devised for children from the less privileged families, and will try to spread awareness about the use of computer and internet. The learning system aims to provide interactive learning environment for children, develop in them self learning ability through Internet, allow them to explore things with an open mind. The learning system will try to compensate for computer & internet illiteracy in Pakistan.

Keywords; *Learning System; under privileged children; computer system; internet; self learning; remote areas;*

I. INTRODUCTION

Pakistan is home to a significant proportion of the population that survives beneath a poverty line evaluated as the cost of basic food and essential non-food items. As a consequence of rampant poverty and government's exceptionally low spending on education (which amounts to less than 3% of the GDP), the net primary school enrolment remains barely over 50 percent. With education sector in such a condition, the question of imparting knowledge and training to underprivileged children to survive in this digital age is simply hard to answer.

The learning system explained here aspires to compensate for the low spending on education and overall lack of IT infrastructure for educational purposes by creating a "virtual classroom" at a street-corner, where underprivileged children can explore and experience the rapidly expanding dimensions of the Internet age, in spite of their poor financial standing impeding their progress. The objective will be achieved by simply embedding a computer system on the outer side of the concrete boundary wall of a school (or any public building) and giving restricted Internet access to the children of all ages. Through this learning system the children will be able to access on-line virtual classrooms, online children competitions, on-line educational games and many other different activities available for children on the Internet. The computer system embedded in the wall will be referred to as "EduScope".
This learning system targets to compensate for the lack of availability of well qualified teachers in the remote and poor areas of Pakistan. The EduScope learning system cannot promise to replace a well qualified teacher but it can promise to keep the children updated and well informed.

The basic purpose of embedding the system in the wall and not placing it in a computer lab is to provide round the clock access of the system to the children. The system will be free to access at anytime and will not be supervised by an attendant. The round the clock access to the system will develop a sense of owning a computer system, in the children belonging to the families who simply cannot afford a computer, this feeling can help in enhancing the self-reliance ability in the children and can motivate them to learn through EduScope.

Another important purpose of this learning system is to enhance and nurture the self learning abilities in children. By nature, children are blessed with a much stronger learning ability and are more stimulated towards learning new things. With the help of this learning system the activities of children will be observed that how Internet can help the children to enhance their self learning abilities. When there will be no restrictions on when to use the computer system or how to use the EduScope in the wall, the children will be able to explore it with an open and free mind and this factor can play an important role in enhancing the self learning abilities of these children.

II. RELATED WORK

This learning system is inspired by a similar project called "Hole in the Wall" running successfully and on a vast scale in India. Dr Sugata Mitra started the "the hole in the wall experiment." He simply embedded a computer system in a wall and attached a high speed internet cable to it in New Delhi. Dr. Mitra simply left the computer turned on, and the people on the streets were allowed to play with it [1]. As a part of his experiment he monitored all the activity taking place on the computer system using a remote computer and a video camera that was place in a nearby tree.

As a result of his experiments he observed that children between the ages of 6-12 years were the most enthusiastic users of the machine. The children who took interest in the machine had very elementary education and almost no knowledge of the computers and the English language but still remarkably in a very short span of time the children taught themselves how to work on the computer and browse the internet.

It also was observed that in the absence of any training, guidance or input that would have stimulated the children to explore and learn, it was mere curiosity, which resulted in learning. This conclusion led to the belief that any learning environment that provides an adequate level of curiosity and motivation can promote learning in groups of children, with no intervention from adults [2]. It was further proven that it is possible to install a computer, connect it to the Internet, and keeps it in working condition in any outdoor environment despite heat or dust, etc

Dr Mitra was very convinced with the results and he believes that 500 million children could achieve basic computer literacy over the next five years, if the government put 100,000 Net-connected computer systems in schools and train the teachers with some basic teaching techniques for guiding children in using them.

A similar project with the help of Hole in the Wall Education Limited (HIWEL) is currently running in Egypt, in which HIWEL offers consultancy, technical advisory, designs, license, estimated costs and other help required to implement the Hole in the Wall project in Alexandria, Egypt.

EduScope learning system is made specifically keeping in view the needs and demands of children belonging to the remote and less privileged areas of Pakistan, special software called EduScope software will run on every EduScope system to help and assist the children in order to maximize their learning.

III. OBJECTIVES OF EDUSCOPE

EduScope learning system focuses on achieving the following objectives.

A.. Compensate for the Lack of Well Qualified Teachers

This learning system called EduScope is devised keeping in mind specially the children living in the remote and poor areas of Pakistan, where there is not just the problem of educational facilities but the biggest problem faced is the lack of availability of well qualified teachers.

In Pakistan due to government's lack of interest in the education sector, there are hardly any facilities for teachers and in most areas teachers are extremely ill paid. Due to these reasons availability of well qualified teachers in such areas is difficult to ensure. If EduScope is deployed and implemented in the manner presented here, it can help in solving this major issue. A computer cannot replace a good and a well qualified teacher but if EduScope are deployed in the remote and poor areas of Pakistan at least all the updated and new trends in education will reach the children of that area through this learning system.

B. Interactive Learning Environment for Children

One of the key objectives of this learning system is to provide an interactive learning environment for children by allowing them to use their imagination without having to confine it to the conventional (and sometimes tedious) academic curriculum. Traditionally, with computers in a lab of a school, children go and sit in a lab and use the computer in a restricted environment for some specified period of time. In contrast, the proposed learning stations, called EduScope, seek to create a new paradigm in the learning process by providing unrestricted computer access to groups of children at a street-corner. It is believed that such an open setting will use child's natural curiosity and ability to stimulate learning.

C. Self Learning Ability in Children through Internet

The EduScope learning system also focuses on enhancing the self learning ability in children through the Internet. When children will be encouraged to explore the EduScope at their own time and free will, this behavior will impart in them the problem solving skills and an ability to think critically. Hence, while a child learns how to use Internet and educational software, he/she also develops an ability to analyze and evaluate information. This ability of analyzing and evaluating the information will help these children throughout their life.

D. Availability of a Computer

The children will have access to a computer 24/7, and this round the clock access will give children a sense of having their own computer. This in turn will encourage and motivate the children to learn when they feel like, at their own pace.

E. Collaborative Learning

The EduScope learning system will also ensure that how children will develop a habit of learning while standing with a group of children, instead of following the usual model of sitting in the class room and giving exams. Gathering of children around an EduScope and giving comments and suggestions to the one who is controlling the station will allow children to explore, share and learn even more as a result of this exchange of knowledge. This collaborative learning effect can be fully utilized and analyzed by EduScope learning stations.

F. Compensate for Computer & Internet Illiteracy

The EduScope learning system aims to compensate for computer illiteracy among children in the underprivileged areas of Pakistan. The learning system is expected to increase literacy, knowledge and general awareness in underprivileged children, who do not have access to computers, schools and other materials of learning.

G. Friendship with the Internet

The EduScope learning system also intend to create a long lasting friendship between the under privileged children of Pakistan and the Internet, with the hope that this friendship will continue and will bring many benefits in the life of these children. This will be achieved by introducing the children at the bottom of the pyramid to the marvelous world of Internet and instill in them the desire to use the Internet.

IV. METHODOLOGY

The plan is to initiate with deployment of small number of "EduScope" on the boundary wall of a different charity schools located in the less privileged areas of the city of Rawalpindi in the province of Punjab. Initially all the EduScopes will be placed within the city, in order to avoid any unforeseen incident.

Once EduScope systems are successfully running within the city, they will be deployed in the remote areas and as a result a whole network of EduScopes called "EduScope Network" will be created. Following are few of the measures that should be kept in view in order to make the EduScope a success.

A. Robust Computer Systems

The "EduScope" will be very robust computer systems as they will be used publicly. They will be free of proprietary software, and will be built around robust platforms to keep them secure and safe. They will be put together in such a way that their cost and power requirements are minimum.

B. Light Weight, Open Source Operating System

Open source, customized and light weight version of an operating system will be used as the main operating system on all EduScope machines. There are many light weight versions of Fedora and Ubuntu distribution of Linux operating system, which are easily available. These light weight operating systems will be used in the EduScopes and only the required software and utilities that are enough to support the theme and educational requirements of EduScope will be installed. Intuitive, easy-to-use, custom, Internet based applications and educational games will be used to aid the children in interactive learning.

C. High Speed Internet Connection

All the terminals will have high-speed Internet access, using wired or wireless broadband. DSL broadband Internet connections are easily available in almost all the cities of the Pakistan, and can be utilized to provide the high speed Internet connection. In extension to this, WiMax wireless broadband connections are also available in the locality, and can also be utilized according to the need.

D. Learning Stations

As the Learning Stations will be deployed on a wall in street, they will be especially designed with tough outdoor conditions in mind. A customized steel case will be made and the computer will be placed inside the steel case. The children will be able to see the monitor screen inside the case and will be able to access it through a specially designed keyboard and a mouse pad. The learning stations will also be designed to be tamper proof by using specially designed frames and materials to protect the system and peripherals from damage. The EduScope is especially designed for children and would be practically impossible to be used by adults.

V. IMPLEMENTATION

A. EduScope Software

Specially designed software is a part of this learning system; the software is designed keeping in view the learning abilities and learning trends of the children of Pakistan.

The EduScope software makes sure that the system usage is divided into twenty-minute timed sessions which will help estimate the number of children benefiting from the learning system. After the expiry of each session, the activity must be resumed which will be logged.

Figure1: Official Logo of EduScope

The content that will be part of the EduScope software is very carefully designed keeping in view the age of the children, the language understanding of the children and the educational background of the children of Pakistan. Most of the content that is made part of the EduScope software consist of flash movies helping children learn about different subjects like History, Geography, Sciences, Mathematics etc. There is also content related to teaching children about discipline in the society and home. It is made sure that maximum content is available through the EduScope software in both English and Urdu language.

A hierarchy of categorizes is made and followed which will help the children of all ages to easily search the content of their choice on the EduScope software.

All the content of the EduScope software will be placed on the EduScope server which will be accessed though the internet. The EduScope software will also allow children to view specific websites. The official logo of the EduScope learning system and the EduScope software is shown in the Figure 1.

B. EduScope Logging System

Logs of the activates of the users will give an insight into the computer usage habits of children and will help develop more effective software applications that are more suited to their general aptitude

A logging module will be developed which will run as a part of the current system. The logging system will work on the push model. That is whenever an activity occurs; an appropriate function is called to log the activity, Logs can be saved in file or a database.

The information that will be logged about an EduScope user will contain information like date, time of login, age and age group of user, time spent on the system. The logs of most frequently viewed EduScope contents will also be maintained. These logs will help in making the EduScope software more enjoyable for the children, as through these logs the favorite activities and the trend of children's interest can be monitored and the software can be tailored according to these logs.

C. EduScope Network

Updating and changing the content of the EduScope software will be a problem to watch because if this task is not properly handled it can lead to the failure of the EduScope learning system.

According to the current design, there will be a central server and all the EduScope computer systems will be connected to this central server, EduScope software will be running on all the EduScope systems. The content of the EduScope which mostly comprise of educational flash movies and flash games will be placed on central EduScope server.

Instead of downloading the content from the EduScope server every time a user wants to access a particular content through the EduScope software, the contents will be downloaded only once on the hard disk of the EduScope system and every time a user wants to view a particular content it will load it from the local hard disk. For this purpose it has to be made sure that the contents of the local hard disk are updated and are synchronized with the main EduScope server. Every EduScope system will periodically update it self on weekly or daily basis by downloading the content from the EduScope server to make sure that it has all the latest material and content present on its hard disk.

The main objective of this design is to make the response time of the EduScope software as quick as possible and to remove the dependency of availability of content from the internet connection. In this case even if the internet connection is down for some time children will be able to access and enjoy the EduScope systems.

Secondly this design will help to update the EduScope learning systems without having to go to each computer system personally and updating the information on it. This is particularly useful when we talk about deploying the EduScope in the remote area of Pakistan. Initially there will only be one EduScope server but with time as our EduScope systems will increase, the number of servers will also increase and they may be divided regionally.

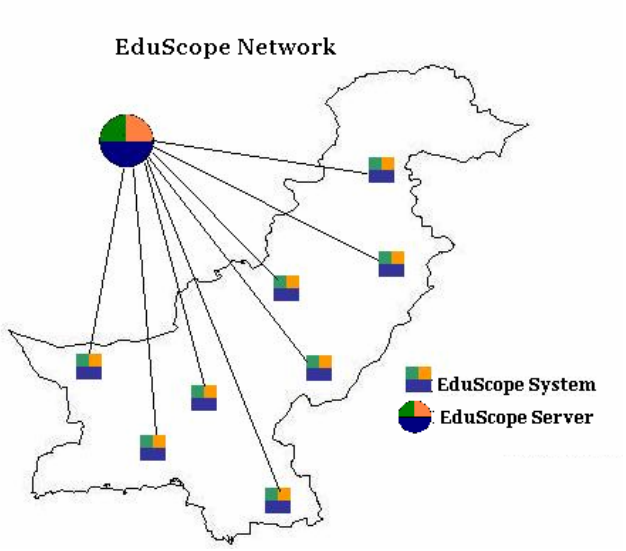

Figure2: EduScope Network

IV. BENEFICIARIES

The people and the groups who are expected to benefit from this learning system are

- The children at the very bottom of the pyramid, from the poor and deserving segment, whose families cannot afford to send them to school, let alone buy them a computer.
- The whole society will benefit from this learning system, if implemented on a large scale (over a span of more than five years).

VII. CONCLUSION

It is believed that this project, or the proposal called EduScope, if started in the right direction can bring a number of positive changes in the Pakistani society, by training the young children who will be the forerunners of the society in the future.

If the outcome and the results of this experimental learning system are according to the exceptions and if they meet the criteria to move on to the next level, it is planned to implement this learning system on a much larger scale.

VIII. REFERENCES

[1] Mitra, S (2000). Minimally invasive education for mass computer literacy, presented at CRIDALA 2000 Conference, Hong Kong, 21-25 June 2000.

[2] Mitra S, Dangwal R, Chatterjee S, Jha S, Bisht R, Kapur P,(2005) Acquisition of computing literacy on shared public computers: Children and the "hole in the wall, *Australasian Journal of Educational Technology* 2005, 21(3), 407-426.

[3] Mitra, S and Rana, V (2001): Children and the Internet: An Experiment with Minimally Invasive Education in India. British Journal of Educational Technology, (32), 221-232.

[4] Mitra, S. (2003). Minimally invasive education: A progress report on the 'Hole-in-the-wall' experiments. *British Journal of Educational Technology34* , 3, 367–371.

[5] Inamdar, P. (2004). Computer skills development by children using 'hole in the wall' facilities in rural India. *Australasian Journal of Educational Technology 20* , 3, 337–350.