

A 24/7 TEACHER: ICT CAN MAKE IT HAPPEN!

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ABSTRACT

The barriers to the spread of knowledge and information in a country like India are manifold, the principal ones being poverty, long distances, access to schools, communication centres and dedicated teachers. Added to this, is the problem of artificial “scarcity” arising out of political and regional influences and society.

ICT is no doubt a possible medium. But it calls for a systematic approach, followed by a disciplined development, design and implementation cycle. This cycle involves (i) studying the reaction of the target audience to new technology, (ii) alignment of new technology to the social and cultural traits, physical limitations and motivation, (iii) delivery mechanisms to ensure sustained usage and value addition and (iv) repeatability across the milieu.

The paper describes the work of the author in the use of ICT in (i) adult literacy, (ii) motivating handicapped children and (iii) guiding nomadic children to inculcate the 3R’s (reading, writing and arithmetic). The primary roles of ICT in each of these cases is as a facilitator and a 24/7 instructor.

The adult literacy project involves the identification of metaphors based on local folklore, entertainment, and social/cultural practices (specific to a region or language) and using them to develop absorbing literacy packages. The packages thus developed can (i) be used by an instructor to facilitate learning, (ii) be used by an individual to learn by oneself and (iii) learn writing skills. Field tests have shown that learners can become proficient enough to read newspaper headlines after going through a typical literacy programme spread over forty lessons.

The one on helping the handicapped uses an element of surprise and discovery in introducing the planetary system.

The nomad education project involves the testing of educational pedagogies to developing instructional resources and using ICT to facilitate its continued usage by the wandering tribes. Anchored instruction strategies form the core pedagogy followed by its reuse using ICT on laptops in the form of (i) video CDs to take care of repeatability and mobility and (ii) virtual scenarios to simulate real-life exercises in arithmetic, logic and vocabulary.

1. INTRODUCTION

The nomads in India are wandering tribes who move from place to place for many reasons, the principal ones being uncertainty in their places of stay and looking for places where there are better chances of livelihood. Further, being de-notified, they have no locus standi to claim formal government aid/benefits. Added to this is the constant fear of the law by which they get arrested and the subsequent agony of exploitation.

The children, therefore, grow up in an environment of uncertainty, insecurity, polygamy and physical violence and subsequently become masters in the same “trade”. No need is felt whatsoever for formal education or even the 3R’s (Reading, Writing & Arithmetic). On the other hand, children learn (or taught/encouraged) to cheat, harm, rob and kill...all under the “struggle for survival” and “Might is Right”.

A number of NGO’s have taken up their cause and are doing yeoman service by providing them places to stay, housing, welfare and education. A few of these communities are the Medhangijoshis in Ambernath, The Masandjogis in Umerga, the Pardhis in Tuljapur and the Gopals in Ansarwada.

Camp schools exist in all the four camps mentioned in the earlier paragraph. Each school has an instructor who is either a resident (Ambernath, Tuljapur, Ansarwada) or in the school during the school hours (Umerga). The teachers are paid an honorarium by the NGO, BVVP (Bhatke Vimukth Vikas Parishad, a Pune-based NGO) in this case.

The BVVP also runs a dedicated school for nomad children in Yemgarwadi (Maharashtra). Children attending this school come from all Maharashtra, with a few coming from the neighbouring states as well. This school is residential.

2. PROBLEMS & ISSUES

2.1 *Basic Cultural issues*

The problems and issues confronting the nomads are one too many. These are seen in their attitude towards

- a) Education
- b) Gender inequality
- c) Hygiene
- d) Healthcare

Education is seen more as an addition to their misery in that the fear that their educated children would never be accepted by the higher societies and, as such, would lead to frustration. Boys are preferred to girls in terms of education and other benefits, whereas girls are meant only to manage the kitchen, rear children and look after them.

Hygiene is given least importance, primarily because of their habitat. This can be seen in

- a) Animals, birds and other creatures moving freely in and out of their tents (called 'pals' in the local language)
- b) Children and adults easing themselves in the precincts of their habitat
- c) Drinking/eating utensils being handled with unclean hands
- d) Water/food containers being kept uncovered
- e) Hands not being washed with soap after answering nature's calls
- f) Water being allowed to remain stagnant, following a bath or the cleaning of utensils

Healthcare is very often administered using traditional cures that involve barks of trees, roots, leaves, flowers and animal products. Added to this is the "medicine" man who practices black magic or hoodoo! Qualified and experienced medical practitioners come on only when things get complicated!

2.2 Traditional learning

The children acquire their knowledge primarily by

- (a) going on business with their parents
- (b) watching their parents/elders engaged in various activities (at work, when relaxing, quarrelling, interacting with children etc.)
- (c) observing and interacting with their age group, elder children etc.
- (d) interacting with their animals, birds and pets

Some of the tribes have folklore and religious tales being related by elders to the children in the community. But there has been no concerted effort to ensure a successful knowledge transfer. Corporeal punishment is the in-thing amongst the nomads in handling errant children.

2.3 The schools

NGOs have come forward to help the nomads live in better conditions and set up facilities to educate the children. The camps where the author has worked, as a part of the current project, have in-camp teachers. These teachers, selected by the NGOs come from the higher communities or from a different nomad community, are able to exercise authority on the nomads in general. In contrast, the instructors from within the community have limited flexibility in that they become answerable to the leader of the tribe (mukhiya). In addition, complaints are common of the instructor using corporeal punishment.

The BVVP (Bhatke Vimukt Vikas Parishad) is the specific NGO with whom the author has been interacting. This body provides financial assistance, legal aid and healthcare to the nomads as and when required. The BVVP has also set up a school in Yemgarwadi in the Sholapur District of Maharashtra. The school is a 2-hour drive from the holy town of Tuljapur, famous for the Goddess Bhavani Temple. This is an hour's drive from another Nomadic camp in Magar Sanghvi., with whom the author is also associated.

The school in Yemgarwadi has classes up to and including Class VII with a total strength of around 300 children attending from all over the state as well as a few from neighbouring states. Children proceeding beyond Class VII are admitted to the State-run schools. These children number around 100. The school is a residential school with all the funds being provided by the BVVP. The school follows the traditional syllabus, chalk-n-talk methodology and traditional evaluation practices.

2.4 The “uncontrollables”

The current scenarios pose a number of issues that need serious introspection before coming up with or even suggesting an “approach”. These, termed the “uncontrollables”, are

- (a) The lack of support from the parents
- (b) The lack of infrastructure in a typical nomad camp
- (c) The lack of a motivated teacher/elder
- (d) Resources, both financial and material
- (e) Absence of any sustenance or dissemination plans

It would be worthwhile to explain each of the above “uncontrollables” in the context of the education project. Parents see no benefits and would rather train their children on their traditional professions/art. Some of the camps have carved out the school from an existing tent belonging to a member, often leading to availability issues as well as limitations in numbers. The IIT team solved this problem by providing tents exclusively for three of the four schools included in the project. But, unexpected problems have cropped up subsequently, in the tents being used for purposes other than education and/or damaged by natural calamities (like the recent downpour in Mumbai (it damaged the Ambernath establishment)).

A motivated teacher is a far cry even in the privileged schools and hence a near impossibility in the schools for nomads!

Resources (in cash and kind) is yet another critical “uncontrollable” in that with the passage of time, the nomads become entirely dependent on the NGO and other agencies executing the project. The nomad camps, associated with the author, are no exceptions. They look for everything to do with education viz., pencils, notebooks, slates and even something to munch in the bargain! The community seems very reluctant to contribute to the whole effort.

Sustenance, cascading and dissemination do not seem to exist in the nomad’s “dictionary”. A case in example: The IIT team conducted an onsite class and followed it up with recall/evaluation sessions over each of the succeeding four days. The result: one-hundred percent recall by the entire class. Give a break of 2 weeks and then go back for an interaction...retention goes down to 80%!

A workable solution was inevitable...and then the search for a near-Utopian solution was initiated.

3. THE SOLUTIONS: TRIED, TESTED AND REJECTED/SUCCESSFUL

3.1 *Traditional Methods*

A traditional teacher, using standard texts and using the chalk-n-talk method: The sessions tended to get monotonous over time...the teacher uttering alphabets/words and the children repeating them...no excitement, no life! The result: children playing with one another, teasing/beating each other, escaping from class...to be sometimes beaten by the teacher/parent. Imagine such a scenario with nomadic children...the ones who wait for the earliest opportunity to skip classes!

Adding value, in terms of demos, charts, models, student involvement and visits are evident in some of the nomad schools onsite. They include counting, colours, shapes, animals, fruits, flowers, maps, alphabets etc, some off-the-shelf and other created by the teachers/students. All of them are hung on the make-shifts walls of the classroom or inside the school tent.

3.2 *Beyond the Classroom*

In an article on ICT and education in the developing world, Hawkins (??) writes: "While much has been changed by the advances of science and technology, education and the way students learn and teachers teach have remained largely unchanged. However, in today's information and knowledge-driven world, a whole new set of skills is required".

So where does one go... to get out of the Hawkins syndrome? One has to get out into the open world along with the children and explore the world together.

3.2.1 Anchored Instruction

A concept put forward by Bransford (1990):"The design of these anchors was quite different from the design of videos that were typically used in education...our goal was to create interesting, realistic contexts that encouraged the active construction of knowledge by learners. Our anchors were stories rather than lectures and were designed to be explored by students and teachers. "

The author explored the possibilities of using Anchored Instruction in more than one way viz.,

- (a) Using Real anchors
- (b) Using videos of (a) as anchors

These experiments were conducted in three nomadic camps (Ambernath, Tuljapur and Umerga), with the initial one being carried out in Ambernath. The modus operandi was as follows:

3.2.1.1 *Real Anchor*: The real anchor used here was the school and its environs. The children were taken round the camp and were, under instructions from the facilitator, asked to observe various animals and birds (their number, their colour

and features), the tents in the camp, the school tent (structure, charts and pictures and their numbers and colours) and some features of the neighbourhood. As a result, the children learnt in a systematic manner the alphabets, numbers, colours, shapes, fruits, flowers, animals, transportation etc.

3.2.1.2 *Video Anchors*: The sequence of the “Real” anchor was recorded on videotape. This videotape/videodisc was shown to the children during a subsequent visit. As a result, the children recalled whatever they had seen in the “real” environment earlier. As a result of a numbers of replays of the videodisc, the children were not only able to recall all that was seen during the “tour” but also see things/objects that had missed their eye.

This methodology was repeated in each of the three camps, viz., Ambernath, Umerga, and Magar Sanghvi, with

- (a) a real anchor specific to the place and
- (b) a video anchor from a different camp.

The experiments (Ananthakrishnan & Ramamritham, 2005) had the expected effects in that the children were able to

- (a) identify other nomadic tribes by observing their dress, location and culture (through a drama enacted by the children of one of the camps)
- (b) identify differences in their habitats
- (c) see similarities in the charts, pictures etc in the respective schools
- (d) find areas that could be neater and better

Encouraged by the success of the ‘dual’ methodology in three experimental locations (Ambernath, Umerga, and Magar Sanghvi) it was but natural to extend the methodology to an entirely alien location and test its efficacy. The alien location that was selected was Ansarwada, in Nilanga. The local school had around 30 children. The experiment proved to be very rich in learning in that the children only looked at another tribe and not their own in a video feedback mode. However, the “Real” component of the ‘dual’ approach was done in right earnest. These successes have triggered a plan to carry the ‘dual’ experiment methodology across the borders of Maharashtra to Karnataka, Andhra Pradesh and Gujarat, primarily because of cultural spillovers across the respective borders. Ultimately, the extension of the methodology to states far off from Maharashtra and in the four corners of the country could prove the validity of the approach...possibly leading to a universal model! (Ananthakrishnan, 2005)

4. ICT and Education

Chapter 4 of the World Economic Forum’s Global Technology Report (2001-2002), very aptly brings out some positive lessons for ICT and Education in the developing world. In this chapter, R J Hawkins lists out the ten lessons as follows:

- i) Computer labs in developing countries take time and money, but they work
- ii) Technical support cannot be overlooked

- iii) Non-competitive telecommunications infrastructure, policies and regulations impede connectivity and sustainability
- iv) Lose the wires
- v) Get the community involved
- vi) Private-public partnerships are essential
- vii) Link ICT and education efforts to broader education reforms
- viii) Training, training, training
- ix) Technology empowers girls
- x) Technology motivates students and energises classrooms

The above lessons are indicative of the major impeding influences with the major ones being infrastructure, gender divide, training and private-public partnerships/collaboration.

Joseph Farrell (1999) points out that schooling is a long-term process in which children may be sorted at many different points and in several different ways. Thus schooling operates as a selective social screening mechanism. It enhances the status of some children, providing them with an opportunity for upward social or economic mobility. It also ratifies the status of others, reinforcing the propensity for children born poor to remain poor as adults, and for children born into well-off families to become well-off adults. Studies on postcolonial education in sub-Saharan Africa reveal that schooling has been a mechanism for perpetuating these/such social inequalities.

According to Obed Mfum-Mensah (2003), computer literacy education in Ghana has been concentrated in major urban areas. A few better schools in outlying areas have attempted to "catch up" with their urban counterparts by contracting with private companies to provide computer education. The costs for private computer training are prohibitive and it is rarely if ever the case that all students have access. Other schools have taken part in the Ghana Education Service sponsored scheme where for every hundred textbooks they purchase from a private firm, they receive one computer system.

The Indian scenario is no different with the digital divide between the urban and rural schools. Children in rural schools do not get the benefit of the wisdom of teachers and experts abundant in the towns and cities. As a result, many of the rural folk are neither aware of good careers or of procedures and systems to get into higher and professional education.

5. The 24 X 7 Teacher: Who is s/he?

A pertinent question indeed! The answer to this lies in one exploring the current pedagogy in schools and the orientation provided by them to take the board examinations on a periodic basis.

The features of the traditional schools are

- The traditional teacher is one who believes in rote learning and uses the age-old chalk-n-talk methodology.
- In most of the rural schools, the rooms are old-fashioned and sometimes in dilapidated conditions and often have poor lighting. The black-boards have been written on for years and have become greyish whiteboards!
- The laboratories have limited facilities with groups performing experiments (Saha, 2005)
- Demos have all the students hounding round the teacher's table in the class or the labs
- There is little or no individual attention
- There is no semblance of post-class or pre-class interactions
- Individual tuitions/Coaching classes are the fashion of the day!

“The 24X7 teacher” is the one all-knowing “abstraction”, who can possibly meet the varying desires and ambitions of the students, wherever they might be! This “abstraction” must display all the qualities of a real-time teacher with the add-on of being untiring and unflinching! “S/he” should be one who can be approached any time, any place!

5.1 The Purpose of the 24X7 Teacher

To provide

- An inventory of all possible questions/problems/issues in the various subjects of the state board/central board curriculum for SSC and HSC in Maharashtra
- Help to the students, from the small towns and villages, appearing for the Board Examinations
- The most up-to-date and authentic information to ensure excellent performance in the examinations
- Help and guidance from experts and teachers located in the cities and towns
- A forum for the students from the cities and villages to interact and enhance their knowledge and learn from one another
- A platform for the students to know more about the culture, society, traditions, living habits, environment etc. from one another
- An opportunity for students to help one another in their work and possible interactions

5.2 The Objectives of the 24X7 Teacher

By making use of the facility

- A student will be able to access all types of questions that could possibly be asked in the Board examinations
- A student will be able to get appropriate answers to his/her queries
- Students will be able to work as a group and find common and acceptable solutions
- Teachers will be able to add/delete/discuss/help students with their proven answers

- Subject experts (from academics, industry & research) would be able to add value to and enhance the answers
- School administrators could work out procedures for maximum exploitation of the benefits provide by such a facility

6. The 24 X 7 Teacher: The ICT Version

The basic structure will be made up of

- A database having all the questions/problems/queries that could be asked by students taking the boards examinations
- A user interface
- Registration to permit access & usage
- A student module (to access subject-wise, expert-wise, teacher-wise depending on permission)
- A teacher module (subject-wise depending on permission, virtual labs, demos)
- An expert module (subject-wise depending on permission, virtual labs, demos)
- School Administrator (school-wise depending on permission)
- Public resources (Libraries, internet, intranet, open sources, virtual labs, demos)

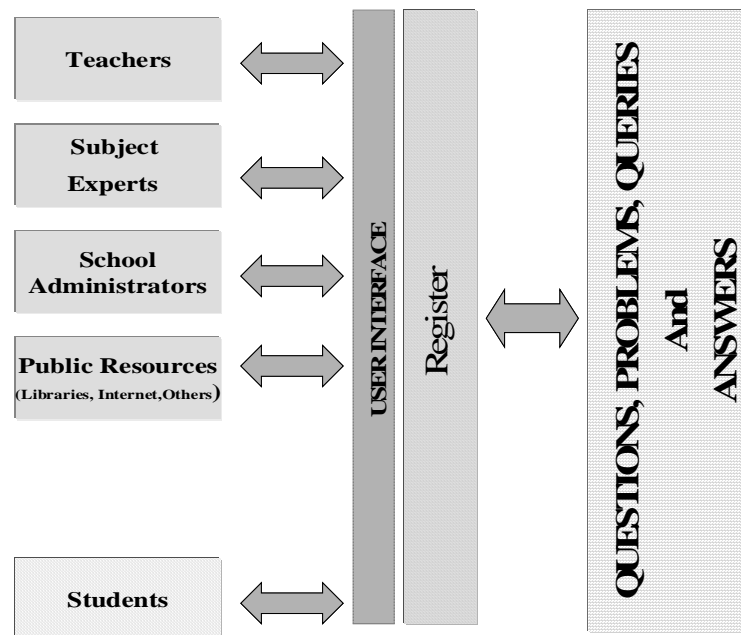


Figure 1: The “24 X 7 Teacher” Skeleton

7. Shaping up of the 24 X 7 Teacher

The 24 X 7 Teacher can be built from the “skeleton” (Figure 1) by adding flesh in stages viz.,

- a) Selection of a suitable public domain application or developing one ab initio
- b) Analysis of students’ needs through
 - Personal interviews with students
 - Observation of classes in session
 - Identification of Experts followed by interviews
- c) Collection of
 - questions and answers
 - doubts and problems faced by students
 - do’s and don’ts in examinations
 - teachers’ and experts’ solutions to students’ queries
 - numerical problems and solutions
- d) Design & development of virtual labs (of standard science experiments)
 - Simulations
 - Projects
 - Scenarios
 - Posers
- e) Design of an user interface
- f) Population of database
- g) Prototyping and test trials
- h) Going live
 - Installation
 - Maintenance
 - Multiplication over a number of macro-locations

8. ENSURING A SMOOTH TRANSITION

It is evident that there will be problems “in transit”. Some of the problems are:

- a) Continuity in the “live-to-Abstraction” shift-over...once too often
- b) Lack of face-to-face interactions in the “virtual” mode
- c) Inter-student interaction ...often “virtual”
- d) Inter-personal communication
- e) Syllabus-specific issues like numerical problems, examples, laboratory work, questions etc.
- f) Private tuition and coaching class “brigades”

Needless to say, all these are “teething” problems, problems that can be solved to perfection! What is needed is the determination to make it happen.

9. ACKNOWLEDGEMENTS

The author wishes to thank Mr. Deepu Prasad, Research Assistant, Development Informatics Lab., KReSIT, IIT Bombay, Mumbai, for the constructive criticisms and valuable suggestions during the development of the 24X7 Teacher. Professor Krithi Ramamritham, Head, KReSIT, IIT Bombay, Mumbai needs special mention for having provided an opportunity and encouragement to develop the current model.

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