

Learning from Kiosks: Observations and Insights

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ABSTRACT

The first experiment with 'minimally invasive' education was set up in January, 1999 by the Cognitive Engineering Research Centre, NIIT, to determine if children would be able to use a public internet kiosk all on their own. This was based on the premise that children learn best when they learn independently and in an unrestricted learning environment. The initial observations suggested that this was possibly the most efficient way to provide computer literacy and IT as a new learning resource to children in economically and technologically deprived areas.

In the six months since then, the experiment has been replicated. This paper reports the observations made at the two locations, the general patterns that are emerging and the inferences that we have been able to draw based on these. It talks about not only the children's learning, but also our learning about how these kiosks affect the community, the kind of issues they highlight, the side-effects that have occurred, and the implications for any future kiosks that may be set up. The paper compares the two locations on several parameters ranging from the physical and technological resources available, to the approaches adopted by the children while using the kiosks. We have described the rationale behind and the implementation of some of the interventions we made at the kiosks. Finally, we discuss the next steps that may be taken and suggest the direction that this experiment may take.

1 INTRODUCTION

Information Technology is becoming more and more ubiquitous by the day. IT Applications are rapidly spreading into all spheres of our lives. However, commentators and experts feel that India might lose its way on the road to the future because of the difficulties in imparting technology education to children, especially in rural or technologically backward areas. Keeping this perspective in mind, the Cognitive Engineering Research Centre of the National Institute of Information Technology (NIIT) conducted an experiment in 'minimally invasive' education (Mitra, S. and Rana, V., 1999). The experiment consisted of installing a PC based Internet kiosk in a slum in New Delhi. The objective was to see if such a kiosk could function in this kind of an environment and if it would be used by the children living nearby. The experiment was continued with a second installation in Shivpuri – a small town and district HQ in northern Madhya Pradesh.

This paper is a logical extension of the one by Mitra and Rana on "Children and the Internet: An experiment with minimally invasive education in India". Its title – 'Learning from Kiosks' has two facets– the first is about how and what the children are learning from the kiosks, while the second deals with what we, the authors, are learning from the kiosks based on the observations we have made, and what we can learn about incidental learning taking place in completely unguided and unrestricted use of computers by children.

1.1 Theoretical Background

In order to understand why this experiment is being conducted in this way, it is useful to look at a few ideas on the ways learning takes place. The world of education seems to come up with new movements, frameworks and theories to explain how learning occurs or how it should be conducted every few years. Each has passionate supporters and detractors who debate on the effectiveness and inherent appropriateness of one over the other. Broadly, however, almost all teaching-learning interactions can be classified as one of the following:

- Those where the teacher or external resource determines the learning content and methodology.
- Those where the teacher or external resource determines the learning content and methodology, in consultation with the learners.
- Those where the learners determine their own learning content, methodology and outcomes and how they will go about it.

Considerable research on the last of these suggests that children are capable of and should be

allowed to manage their own learning. In fact, the basis of this idea was first evinced by the distinguished American philosopher-educationist John Dewey over a century ago that 'the child's own instincts and powers furnish the material and give the starting point for all education.' (Dewey, 1897). The constructivists (Piaget, 1950), social constructivists (Vygotsky, 1978), experientialists (Rogers and Frieberg, 1993) and the proponents of Open Ended Learning Environments (Hannafin, 1996) have all suggested that children build their own knowledge by constantly engaging in tasks of their own choice.

Many educational technologists and curriculum designers have extended these theories to the use of computers in education and say that children should be allowed to play with computers and learn on their own. However, we, the authors, have so far not come across (in a quick look at contemporary research) any who say that there should be NO initial guidance. The experiment conducted by NIIT is perhaps the first to indicate that a totally unrestricted and unguided use of computers will be equally successful in providing children with basic computer literacy and the ability to use IT as a valuable learning resource.

In this context the eventual outcome of this continuing experiment becomes even more important since the problem of providing quality IT training and computer literacy for children may no more be an issue.

1.2 Objectives

- To observe, compare and form inferences about the patterns seen at the Kiosks in Kalkaji and Shivpuri
- To identify the kind of learning occurring, the way it is happening and the factors affecting it
- To determine the course of action for the next stages of this project

1.3 Methodology

The experiment initially consisted of just the kiosk at Kalkaji, New Delhi. Three months later, an additional kiosk was set up at Shivpuri, Madhya Pradesh.

The observations were made in two ways:

- **Field observations** – The observer would stand next to the children at the kiosk unobtrusively and take notes on the users – their conversations, what they were doing, how they were going about it etc. Occasionally s/he would talk to them to find out more about what they did at other times and what they thought about the kiosk. These diaries also track individual users (see Appendix).
- **Indirect Observations** – At times, the activities at the Kalkaji Kiosk were observed indirectly by using a Remote Desktop watching tool. This gave the observer complete freedom to see what was happening from the comfort of an office. Interestingly, some of the users recognise the Remote Desktop Watcher icon on their machine, and switch it off because they don't want anyone to 'see' them while they are working. Other indirect observations were made by viewing the History files at times to see what sites had been accessed – which were the most popular etc.

The observed patterns at the two kiosks are reported in the next section.

Although the experiment did not involve any initial guidance on how to use the Kiosk, we did plan some interventions after the initial phase, in terms of the resources provided. These interventions, and the rationale behind them, are described in a separate section in this paper.

2 OBSERVATIONS

These are the observations that we have been able to make on the basis of the detailed direct and indirect observations. The original diaries are available with the authors on request.

2.1 Installation, construction and hardware resources available: The Kiosks are Pentium multimedia PCs with only the monitor and the touch-pad (built into the wall next to the monitor for user input) visible to the user.

Kalkaji

Installed on Jan 26, 1999 about 25 feet from the first house of a slum, facing a large vacant lot. The Kiosk overlooks a footpath travelled frequently by the slum dwellers and anyone using it as a shortcut. Access is from outside the boundary wall of the NIIT office

Kiosk housed along a wall, in a brick construction inside the NIIT compound in a small, enclosed area. The wall faces west and gets extremely hot in the afternoon sun. However, the PC seems to perform adequately even when the AC provided for this purpose is not functional.

Full time 2 MBps Internet connectivity. No keyboard (except when there was a direct intervention for Front Page, for a few users)

Shivpuri

Installed on May 4, 1999 within a Govt. Middle School compound directly opposite Shivpuri's main bus stand. The Kiosk is about 50 feet from and visible from the main road that sees thousands of locals and travellers everyday.

Kiosk housed in one of the school rooms, with one window being used for the display, and the others boarded up. The kiosk faces North East and the glare from the morning sun makes it difficult to see the monitor.

No Internet access for the Kiosk users. Occasional keyboard use (as and when the caretaker was present at the Kiosk)

2.2 Perceived Environment and Access: Both kiosks offer easy access to anyone walking past.

Kalkaji

The Kiosk is in neutral territory. It has no association with the slum nearby except that the vacant lot in front of it is used as a public lavatory. However, have seen all kinds of people using the Kiosk, including children from affluent families (who have a computer at home).

The Kiosk is easily accessible to all the people who live nearby (in the slum bordering the NIIT wall, residential colonies of Kalkaji and Govindpuri) and people who use the footpath in front of the Kiosk as a shortcut (includes hundreds of school children, labourers, office goers etc)

Shivpuri

Although the Kiosk is inside a school compound, the general area has a slightly unsavoury reputation for gambling amongst the middle and upper-middle class families of Shivpuri. However, this seems to deter only over-protected children and girls from using the Kiosk.

The Kiosk is easily accessible to all the people who live nearby, shop-owners of the bus stand area, children of the middle school where the Kiosk has been set up, people passing by the bus-stand not in a hurry to catch a bus.

2.3 Regular users, their backgrounds, and usage patterns: There is little or no overlap in the regular users' ages for the two kiosks. (*Individual case studies of some users at both locations are included in the Appendix*)

Kalkaji

The regulars are young children (age 6 to 12) who live in the slum right next to the Kiosk. Almost all the boys in this age group are users, but only some of the older girls frequent the Kiosk. The majority are at the Elementary school level (below Grade VIII). They all go to some school (either the Govt. school or 'Ready Go Welfare School' nearby).

Shivpuri

The regulars are teenagers (age 13 to 19). They are mostly at the senior school level (grade IX and above), but once the Middle school reopens (July 5th) the pattern might change. The schools they go to are the Govt. No.1 and No.2 schools in Shivpuri.

Other users include older children and teenagers from the slum and the surrounding colonies.

None of the adults or parents of these children seem to be making any effort to use the Kiosk.

None of the regulars have had a prior exposure to computers except for Sanjay, who has done a basic course on computers from IGNOU.

Most used from 9 am to 11 am or so (during the summer vacations), and after 3 or 4 pm till about 8 or 9 pm (kids go away early, the older users stay late)

Most users spend 1 hour or more in a go (taking turns of course).

The Kiosk is very high priority for the younger kids. This is part of their daily schedule. The slightly older kids treat it on par with or slightly lower than other games (eg cricket).

Some middle school children and some of the people (20+) employed in that area (in the shops around the bus-stand) make up the rest of the users.

In the 4 days that the Kiosk was under detailed observation, there weren't any female users (adults or children) at all.

Most of the teenagers have had a minimum exposure to computers since they are taught 'computers' in school. However, it is unlikely that they have worked before with a multimedia Internet PC. A few have a much better idea of how to use a computer because of having played computer games.

Most used from 11 am to noon (may have been earlier if the Kiosk had been opened regularly at an earlier time), after 4.30 or 5 pm till shutdown time (usually 8 pm)

Most users (with the exception of one or two) spend about half an hour on any activity.

The Kiosk is a priority only as far as entertainment goes. It is not a regular feature except for a couple of people. However, this observation was made during the summer vacations and may not be generalisable. The older users came often from their work, whenever they had time to kill.

2.4 Motivation

Kalkaji

The Kiosk is like any plaything with the additional advantage that it has a lot of variety. The primary motivation for the younger children is to play with it and figure out stuff on it so that one can do more with it.

There has also been extensive media coverage of these kids and this may have a subtle influence on the children (since using the Kiosk may be seen as a desirable activity by the world)

Shivpuri

The teenagers are well aware of the job opportunities involved and want to learn computers. Computer courses are expensive so this is one of the reasons why they come to the Kiosk.

There seems to be a friendly rivalry between the No.1 and No. 2 schools and doing well at the Kiosk is a small part of this as well.

2.5 Most popular uses and what they would like to do: At both Kiosks, games are extremely popular and everyone would like to play more of them. Putting ones name on the computer is a favourite activity. Both sets of users also expressed the desire to see movie clips on the computer.

Kalkaji

Browsing the web – esp the Disney Web site where they love playing Games, and navigating stories and cartoons. Also use the web to read news, horoscopes and short stories. The Hindi news sites are popular as are some Bollywood sites. Although there is evidence of accessing pornographic sites, this is a rare phenomenon

Shivpuri

There hasn't been web access for a while now (none except at the beginning), so no browsing. Songs are the biggest priority and the power of Bollywood is evident. Everyone who comes to the Kiosk first reaches for the songs directory and plays them. Movie clips, even if only 25 seconds long, are extremely popular.

and is done only by some very infrequent older user. The younger children say *"hame gandi picture nahi dekhni."*

Paint is VERY popular. Almost everyone has used it to make pictures or write their own names Like hearing songs (mp3), but that's usually to provide background entertainment.

A few of the kids have started learning how to use Front Page Editor and are making basic web pages with text and images.

Using a combination of Charmap and other applications to write their name.

Since the users are younger, they would like to do anything which is interesting especially video clips.

Did not see anyone use Paint on their own until it was left open on the desktop or a shortcut to it was made on the desktop itself.

Using DOS to create own directories and small extensionless files (with one or two lines of text, and in one case two 5 digit numbers which could only have been phone numbers, in a file called "Neha").

A couple of users have started creating basic web pages (after intervention) in Front Page, for making advertisements for their 'Comics and Video Game Centre'.

Would like to browse the sites that they can see links to but can access. Some of the more aware users want to start using email and 'learn' computers in the sense of using applications. Don't know if they have any idea of working on programming. Would also like to take printouts.

2.6 Competencies Achieved: All the users have achieved a working knowledge of the Windows OS and can use the pointing device to point and click in order to select, and double-click to open. They can play songs in WinAmp and launch applications such as Paint and Word but the styles of working differ.

Kalkaji

Use of the right click for properties (and to create new objects folders and shortcuts on the desktop).

Click and drag to move items and create shortcuts.

Keep trying to select different menus/ menu items and know most of the standard ones and how to use them (Example: use the Undo, Cut, Copy, Paste options in the Edit menu or the File...Save As).

As a result know small features such as Set as Wallpaper in Paint or Explorer.

Very comfortable with idea of cut/copy and paste but maybe not the fact that it happens throughout the interface (i.e. can cut-paste across applications).

Using Character Map application to insert text into other files.

Using Find in the start menu to find files but without any specifications (in fact, someone used Find *.* in C: and picked out charmap.exe from amongst the thousands in the search results).

While some of the brightest lot do understand the folder hierarchy, others don't understand it.

They also don't try to name the folders (they don't have a keyboard and haven't yet figured out how to copy-paste into dialog boxes).

They realise that files have to be 'saved' to be available on the machine and do a 'save as' but since they don't change the name 'untitled', Paint files are often overwritten.

Do not have to have new content all the time (there was a period of about 4 – 5 days when there was no net access, but everyone still used Paint quite happily).

Shivpuri

No or very little right click use.

Click and drag only being used in Paint rarely where the pencil will not draw otherwise.

No idea of how to do multiple selections in Explorer/Dialog boxes.

Use the menus but only a few options such as Undo, or New in File. Are not trying most of the options in the menus. As a result, are unaware of a lot of the capabilities of the applications.

Do not know understand the idea of a copy paste very well. Perhaps sporadically but not as a general rule.

No use of Character Map at all. Have no way of using text if no keyboard is present (a virtual keyboard was installed only recently which pops up a keyboard on the screen and can be used to enter text using the touch-pad alone).

No use of Find or any of the other tools. Can change screensavers and background from the Display Settings.

Know that ctrl+alt+del restarts the computer (from their prior exposure).

Understand the folder hierarchy and are able to find things inside them.

Have to have new content all the time. Even if an activity has not been 'mastered' they would rather move on to something else.

Are able to edit a web page in the browser, and can delete pictures, lines of text.

Prefer to create a bitmap object first and then open it so that paint is launched automatically. The object is what is manipulated.

Prefer to go through the Start menu to Programs to start a particular application and then say New inside it to start making something. The process seems more important than the object. (*Is this a function of their developmental stages?*)

2.7 Learning Process

Kalkaji

In general, a highly exploratory approach is followed. Not afraid of clicking anything new or following any link. Usually do a left and right click on a new button or link.

Very good memories – one kid remembered the entire sequence of frames on one of the Disney site visual stories. As a result, are able to remember the steps that they followed to get to a particular thing and repeat them.

Are not very good with English (are ok with decoding the letters and pronouncing them but very little comprehension). But are still able to match phrases with events and get by quite comfortably.

Have a large amount of patience – can spend a long time getting something just right in Paint. Peer tutoring is happening with Sanjay as the main resource.

The children have developed their own terms to describe the objects and events that they encounter while working on the Kiosk. While the applications and web sites are referred to by their names, the arrow cursor is called a *sui* (needle, in hindi), the crosshair is called a *kaanta*, *daabna* is clicking (hindi equivalent of pressing, but no distinct terms for left/ right/ double clicks), *sabse rangeen button* for the Start button on the taskbar, *damroo* for the hourglass icon, *kaam kar raha hai* when the hourglass rotates, *macchar ki dawai* for the spray tool in Paint.

The touch-pad is called just that because the kids overheard the observers and caretakers use the term before they had a parallel term of their own.

The children are friendly with the observer / caretaker, but tend to work more independently. Only when the other person has been established as some kind of authority is he/she asked for help.

Shivpuri

In general, the approach is to do the things that they already know about or have learnt about earlier, probably because they don't want to get things wrong. Thereafter, if there is a need to do something, for example, make a piece of text bigger or smaller, then only do they experiment with different buttons, or menu items.

Are ok at reading English and can often match words and phrases with actions (example, Exit will close the program). However, this is true only for the school going users. The others still work by matching patterns.

Not very patient; seem to get frustrated more easily. However, this is probably because they don't have as many 'interesting' things to do.

When they are doing something worth while – such as creating a small web page or a picture or figuring out a game, they take their time.

Peer tutoring is happening with the Goyals being the main resources.

No special user language was observed. The reason for this could be that some of these users have had prior experience with using computers and are carrying over the terms from there.

Other newer first generation users overhear these terms and naturally start using them.

The tendency is to ask a caretaker or observer (if present) what to do at every step. Wary of not getting it right the first time.

2.8 Changing Perceptions

Kalkaji

On the first day, they thought it was a video game being put up for free. Most of the very young children tried it out on the very first day. One of the slightly older (about 11 or 12) ones

Shivpuri

Thought it was a video game being put up on the first day. People afraid of using it because they thought it would cost money or someone would order them away. Once they were told that it was

stayed away initially because he thought it would cost money to use.

Initially felt that the Kiosk was basically a TV on which there were channels with stuff coming at them. Now since they have been playing games and making things of their own, there is the feeling that it can do a lot more and act as a permanent storage.

put up for anyone to use, they started fooling around with it.

Even low quality movie clips are popular, considering that a TV usually has better sound and image quality. Perhaps their prior exposure to non-multimedia computers makes them treat this as a special thing. Or else it may be the interactivity which is missing in a TV.

Now they are able to accept the computer as something which can do a lot of things, rather than just process text.

2.9 Community reaction

Kalkaji

The adults don't try to use the computer citing reasons such as "We don't know the language", "We don't know how to operate it" etc. One elderly lady asked if it would provide food for them. Parents in general felt that while they could see no need for the Kiosk, it was very good for the children.

Shivpuri

People generally feel it is a good idea but that guidance is needed otherwise the children will not know what to do and 'misuse' the Kiosk. Some also feel that the location is not right because of the undesirable elements who frequent that area.

Some of them do say that it should be locked up regularly to prevent vandalism. Although no adults have come forward, one of the older teenagers has said that he is willing to ensure that the keyboard is used properly if he is made in-charge of it.

2.10 Vandalism

Kalkaji

Initially none even when the older kids from the Govt. school nearby came to use the Kiosk. Since May 31st, the touch-pad was damaged 3 times in 21 days. This was happening almost always on a Sunday.

The regulars say that it is the older kids who are doing the damage. However, based on what some of them have said, it seems some of the very young children have also been scratching and smashing the touch-pad out of frustration when the Kiosk was not working.

So that they would not take the replacement of the touch-pad for granted, we boarded up the Kiosk for a few days (from June 22 to July 7, 1999). We hoped this closure combined with a talk with the kids about taking responsibility for the Kiosk would work.

However, there have been incidents of vandalism since then as well, and the kiosk has been temporarily shut down again till a metal cover for it is built.

Shivpuri

The mouse was stolen once (pulled out from inside the Kiosk through the opening for the keyboard. Another time the touch-pad wire was cut. According to a visitor, he saw people pulling out the keyboard, trying to pour concrete pieces into it, and pushing in small sticks.

However, since then, there hasn't been any damage to the computer as such (the door to the room was broken once by some over-enthusiastic kid while Gagan, the caretaker was inside).

The keyboard is never kept outside unless the caretaker is present because that is the most easily damaged part of the computer.

3 PLANNED INTERVENTIONS

As described earlier, interventions, in the form of resources made available to the kiosk users, constitute an important part of the experiment.

“Constructivists talk of learning in which the learner arrives at shared negotiated meanings - maybe with a teacher, maybe with other learners. Logically, if determining the meaning of things is delayed until the moment of learning, designers cannot determine in advance the nature of the content” (Brown, 1996). Instead of formal content areas, the authors proposed knowledge domains and skill areas which they think are of educational value or will improve Computer Literacy. We intended to provide software and even human resources (for informal guidance) in order to conduct indirect interventions which may (or may not) lead to the users building their own knowledge about these areas.

What we understand by a minimally invasive approach is that the children are basically given some resources and then left on their own to explore and learn by their own methods. The interventions are thus not formal instructional materials and so do not go against the principle of being minimally invasive. However, in this approach it becomes very important to recognise the timing of such an intervention. Our first intervention – that of creating a Portal for the children to provide access to some specific content was carried out after the children had become adept at using the Kiosk. The second was to initiate and encourage the creation of web pages by these children.

3.1 Portal

In order to facilitate access to various sites on the Net, we created a portal two months after the Kalkaji kiosk was initially put up. The links in this portal were based on data collected on the sites most visited. Links to popular Hindi sites (stories, newspapers etc) were also added. This portal was revised again two months later with categorised links to other sites as well. At Shivpuri, a similar portal was initially designed with a lot of local content (articles and photographs of Shivpuri). In order to compensate for the lack of ‘interesting’ content, dumps of some of the more popular sites were taken and loaded on to the Shivpuri kiosk, and the portal was revised to include links to these as well.

The main idea behind the portal was to make it easy for first time users to find what they wanted. Experienced users used the portal to get to other sites and content which they would normally not have been able to get to because of the absence of a keyboard.

3.2 Web Page Authoring

After three months of leaving the children on their own with the kiosk, we decided to guide the children at Kalkaji in how to use Microsoft FrontPage to create web pages. The idea behind this intervention was that they could all make web pages about themselves and put it on the net.

We initially asked for volunteers who would learn how to make web pages and then teach the others. The children were asked to collect the information that they would like to share about themselves. In two days, the children collected the information and made a rough design of their home pages on chart paper.

The children then made a web page after opening FrontPage, called ‘children.htm’ in which they wrote their own names. They were told to make their own images in Paintbrush. On the fourth day, children inserted pictures and text to make a home page. The process of explanation was simple – the nearest two children were given ideas about how to go about it and they in turn explained it to the others. The girls complained that the boys didn’t let them use the computer so they could not make their images.

After another gap of three days the children were adding images and text on their own. A week after that we noticed that the children had started making web pages regularly on the kiosk. They had even learnt how to insert text in FrontPage without the keyboard. Most of them liked to put their names and some pictures in it. The other text that they had planned (about their colony, number of people etc) could not be put because of the language barrier. While they wrote all this in Hindi, they could not type in English.

A similar intervention in Shivpuri was carried out, where a group of older children wanted to make a web page about their shop in the nearby market. We guided them by giving hints on how they should go about it. For example, once the concept of a ‘link’ was explained – they were left on their own to find out how to insert a link and specify its target. Within a few hours, they had picked up how to insert

text (they had access to a keyboard at the time), pictures, and how to link a piece of text or an image to another file in the computer.

4 INFERENCES

A few inferences based on the observations at the two kiosks can be made.

4.1 Formation of UGIL

First generation users tend to form their own language for referring to events, objects etc. We have chosen the term 'User Generated Intuitive Language' (UGIL) to describe this phenomenon (see 2.7 'Learning Process' in the Observations section). The significance of UGIL and learning becomes evident when one looks at the following:

- If these children have to be able to acquire formal learning at a later stage, their UGIL will have to be taken into account.
- Testing/assessment under such circumstances becomes an issue. A method to test the skill levels would have to be devised keeping UGIL in mind.

4.2 Factors which influence Learning

- Age – The younger users (6-12 yrs) seemed to be more inventive and uninhibited in their approach to using the kiosk. The older children (12-18) are more afraid of making mistakes and are not as experimental with new things. At Kalkaji, the older users are also apprehensive in using the kiosk in front of younger children as the younger children tend to know more than them. This attitude becomes even more apparent as they grow older. Thus, the adults rarely visit the Kalkaji kiosk to learn. However, they definitely come to see the things that their children have created on the kiosk.
- Prior Experience – Users with some prior experience approach the kiosk with some fixed attitudes and perceptions of what it is capable of and what one can do with it. First generation users (such as the children at Kalkaji) do not have these preconceived notions and have possibly been able to discover more about different ways of using the kiosk than some of the users at Shivpuri who have been told about computers in their schools.
- Resources – Availability of resources (Internet or any other software) plays a large role in the learning taking place.
- Peer tutoring – Peer tutoring has taken place at both the kiosks to a great extent and is one of the factors that has enhanced the learning. Research on the subject (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Rysavy & Sales, 1991) indicates that the advantages of collective effort are that children are able to reflect on and elaborate not just their own ideas, but those of their peers as well. Children come to view their peers not as competitors but as resources. Mutual tutoring, a sense of shared progress and shared goals, and a feeling of teamwork are the natural outcomes of cooperative problem-solving, and these processes have been shown to produce substantial advances in learning.

4.3 Incidental Results

At both Kalkaji and Shivpuri, familiarity with English words because of associations was observed. For example, realising that 'Quit' means to stop doing something because clicking on it leads to closing the program.

Kalkaji:

- Improved vocabulary due to games such as Pluto's Boneyard at the Disney Channel site.
- Enjoyment of creative activities such as drawing which are treated as boring when conducted in school (*possibly because there is much more freedom at the Kiosk and more interesting tools*).

- Creation of a divide on the lines of 'Knows and Know-nots' rather than the traditional 'Haves and Have-nots'. There is also a new pecking order depending on ability of using the Kiosk rather than age or physical strength.
- More friction among the users (and even their parents) because there is a greater demand for the Kiosk now as more children learn how to use it, while the 'supply' has remained the same.
- Children have become used to media attention and although they are still excited about a shoot, its not a big occasion any more. All the coverage might affect their motivation and reasons for working on the Kiosk.

Shivpuri:

- Kiosk being used as a place to practice and try out the things learnt in school by the School children.

5 RECOMMENDATIONS AND PROPOSED ROADMAP

5.1 For the experiment to be replicated, we recommend the following:

5.1.1 Content and Resources

- In the case of kiosks with Internet access, the portal should be designed seeing the preferences of the users.
- In the case of non-internet kiosks, a well-designed package of diverse interactive content should be made available on the kiosk.
- Since games are very popular, In both cases the most appropriate games should be made available depending on the age of the users (Ahuja et al, 1995).

5.1.2 Location and installation

- Define primary users (keep in mind who they will be and who will benefit most)
- Glare on display needs to be avoided (build kiosk with monitor facing North, or between building so that there is no direct sunlight)
- The location should not be considered disreputable by the local community.
- There should be a reliable volunteer as a caretaker (perhaps from the community itself)
- A strong enclosure to prevent break-ins or damage to the Kiosk is required.

5.2 Proposed Road-Map

5.2.1 General steps to be taken:

- Increase the number of Kiosks at a location and see if that reduces the vandalism. This may also result in faster learning due to the 'competition'
- Find more content for the internet kiosk – Hindi email, Hindi search engine, encyclopedia, reference sites, fun stuff like vrmf, other games, more music... decide a good resource/content package – keep refining it.
- Design a good startup package of content which can be put on a non-internet Kiosk as well.
- Find a way of giving net access or at least updated content to a Kiosk which doesn't have 24 hr net access.
- Develop a set of guidelines for a caretaker, such as instructions on maintenance, what to do in case of problems etc.
- Install and observe a Kiosk at one more location, in a rural set up (metropolis and very small town already done).
- Find a way to remotely monitor, configure and maintain a kiosk in a remote location so that interventions for learning or for corrective purposes can be made at the required times.

5.2.2 Further planned interventions:

- Connecting with other Kiosks or other computers through email/chat
- Encouraging greater use of text
- Aiding conventional learning through educational content
- Image Editing –art beyond Paint

- Experimenting with Sound/Movies
- Encouraging Electronic Publishing
- Games which build cognitive skills – Epistemic Games (Sherry and Trigg, 1996)
- Putting the users in control – some kind of programming (such as Hypercard or other similar applications)

The Roadmap should be reviewed and modified after at least 4 such installations.

6 CONCLUSION

It appears that by letting children use computers entirely on their own with a few well planned interventions from time to time, it is possible to get computer literacy closer to the common people. This approach has the potential of increasing computer literacy in rural areas, especially for younger children.

Several factors affected the learning taking place in these situations – the age of the users, their prior exposure to computers, the kind of content and resources provided, and tutoring by the peer group. These factors should be considered while designing any interventions for such kiosks.

It is also suggested that the experiment should be repeated in a few extreme environments to test the hardware/software constraints and observed over a longer duration, before it is replicated in large numbers and its effects can be truly generalised.

Finally, in the words of Erik F Strommen (1992), “If we are to give these children the education necessary to succeed in our technologically intense, global future, a new form of educational practice, one that builds on children’s native learning abilities and technological competence, must replace our existing methods.”

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8 APPENDIX

CASE STUDIES OF INDIVIDUAL USERS

All these users are basically adept at finding their way around Windows. This means that they all understand how to open, close, move, and resize Windows. They also know where to click/ double-click/ right-click; how to use the start button; how to launch applications like IE, WinAmp, Paint, FrontPage etc. Although it is not known who first started using Character Map to insert text into Word and even Paint, all the 'regulars' at Kalkaji are at ease with this feature as well.

Rajender (The Natural Techie) is 8 years old and studies in the 3rd standard at the private English-medium 'Ready Go Welfare School' near the slum. He was acknowledged as one of the best users of the Kiosk, second only to Sanjay (who had done a formal computer course from IGNOU – the National Open University). There wasn't any animosity towards him because he was better than the others. On the contrary, he often acts as the Test Pilot – i.e. he figures out what works and what doesn't and then the others pick it up from him.

He can read English words, and even if he doesn't understand them, he is able to remember menu items and buttons and knows what does what. Rajender is not at all aggressive and is willing to take turns. While working on the Kiosk, he doesn't seem to like the clutter of having several windows open on the task bar at the same time and closes them all before doing anything else (quite like most experienced fussy users). The others invariably don't close windows, they tend to just minimize them. He is also better dressed and cleaner than most of the others so there might be a correlation between the two.

The following incident is very revealing about his natural inventiveness and ability to work with computers: "While working in FrontPage, Rajender chanced upon 'Insert->Symbol' in the menu (possibly because he had used it to insert images) and that gave him a box similar to the Character Map in its layout. However since this dialog box only selects one character at a time (unlike C Map which lets you select a whole string), he only got RRRRRR whenever he pressed Insert (the last R in his name). He stopped, looked at the box for a minute or so, then quickly cut out the Rs and this time pressed 'R', 'Insert', 'A', 'Insert' and so on... till he got his name in FrontPage without a single keystroke!"

Interestingly, while all the media coverage on the Kiosk has turned him into a celebrity, he has of late dropped in the local rankings because he had gone home to his village for the summer when they 'discovered' the Disney Channel games and activities. Some of the children say that he is now at the Number 4 or 5 position because he is not as good at loading or playing them. Rajender wasn't too happy about this but at the time of writing this he had already figured out most of the games and was back in contention for the top ranks!

Sher Singh (The User) is also the same age and in the same school as Rajender. He doesn't always figure things out himself but is very good at picking them up from the others (he saw Rajender insert text in FrontPage exactly once and was able to do it on his own the next time). He is more of a User than a Figure-Out-er.

Sher Singh likes drawing in Paint the most – especially flags and the more typical mountain, river and countryside scenes. He uses all of the tools including the bezier curve to draw. He is not good with English (doesn't know how to write his own name) but can still find his way around possibly by matching symbols and icons. The best example of how he does this is the way he runs Character Map – by clicking on 'Find Now' in 'Find: Files or Folders' which by default finds ALL files in C drive, and then looking through the huge list till he finds charmap.exe by its icon.

He has not figured out a lot of things about the computer and doesn't understand the concept of filenames or even folders, because during a 'Save as' he made some 20 new folders and still didn't manage to save the picture.

He is also very aggressive and cusses freely, and regularly picks fights even with the older children.

Rajkumar (The Surfer) is an older kid (about 10 or 11) at Kalkaji who says he would rather play 'bat ball' any day, and anyway only 'kids' played with the computer all day. Perhaps he is at the age when the peer group is more important than a new toy. He is relaxed, calm and sensible and uses the computer for looking up everything from stories to horoscopes and pictures and back issues of newspapers.

He says he doesn't know very much English so he randomly clicks every button or link to see where it goes. This strategy has obviously worked for him because he is the best amongst the kids for starting new games etc. He has a phenomenal memory – remembers exact sequence of pictures and events in the Disney site animated stories. This helps him in finding a site again after he chances upon it

during his 'accidental' clickings. He knew how to save pictures on the web onto the computer locally and even knew that trying to save a picture before it had loaded fully would be of no use because the Save As option was greyed out. Interestingly, he also said that if a picture is got everyday, then it comes faster (an intuitive idea of a cache?).

Rajkumar's random clicking has also led to selecting screensavers, finding and loading games, and running animated stories on the Disney web site. He spends time on the computer only in the evenings after dinner when there is no one around.

Ankur, Anuj and Tanuj Goyal (The Experts) live near the Shivpuri Kiosk and come almost everyday to work on it. The family owns the Goyal Comics and Video Game Centre nearby and so these children (all between 16 and 20 years of age) have had some kind of prior exposure to computing. In fact, all three have worked on a PC before (the oldest has done some basic course as well). They were comfortable with the win98 os but could not imagine using only the touch-pad for typing text etc. Had heard of and even used to a small extent packages like PowerPoint and even CorelDraw. Ankur very keen on learning 'Graphics'. And all three were aware of the net and its capabilities and asked me if email could be put on the Kiosk so that they could ask us questions about how to use it.

The three are avid gamers and good at figuring games out between themselves (with other people as well). They have also seen high quality Sega games and the like and understand that the benefit of a computer is that it can do many things other than just play games. They say that they want to work on the Kiosk to learn more about the Net (as and when that happens) and to build their 'knowledge'. However, in spite of having access to much better games (in terms of quality of graphics), they were equally keen on playing games on the Kiosk.

When they use the computer, they usually read the menu items and try to guess what it might mean. In general, they are not scared of clicking on various things but are still not as free and openly explorative as the Kalkaji kids. One of the most fascinating uses they are putting the Kiosk to is as an advertisement for their shop. From the Shivpuri home page, they have made a link to a page which gives its name and address and has a photograph of Shivpuri which they found on the

Ankur is especially keen on using the Kiosk and is even willing to take responsibility for locking and unlocking the keyboard (since he says he is one of the few people who use it) if a separate access mechanism is made for it. In general, he is the most helpful of the three and enjoys telling the other users how to go about things.

Raju (The Skill Seeker) has just finished the Xth class exams in Shivpuri and is contemplating what stream to take next. Whatever he takes, he wants to 'learn computers' because that's the best guarantee of a good job. He knew that NIIT offers courses but balked at the price-tag and basically came to the Kiosk so that he could learn something for free.

Although he had seen computers, he had not used them before. Afraid to try things out on his own because he feels that he will get things wrong and so prefers to ask whoever is around what to do next at every stage of the way. While his English is good enough to read text, he doesn't really read what he's clicking on or selecting – it is still very much a trial and error process rather than educated guesswork.

Bhanwar (The Oldie) is probably the oldest regular user (in his late 20s or early 30s) among both the Kalkaji and the Shivpuri Kiosks. He works near the Shivpuri Kiosk (not sure where), and comes in in the evenings for an hour or two when a group of local volleyball players meet at the ground in front of the Kiosk.

He has not used computers before but has worked out most of the basic operations that everyone else knows – launching games, songs etc. Has also done a bit of drawing in Paint but is in general content with doing only a few things. He is one of the few adults with a natural curiosity to try out things which is probably why he spends time at the Kiosk.