

Learning computer skills as a creative resource

A computer is a machine that makes the work of humans easier. In the recent past the ability to understand and use a computer in itself has become a specialized field in education. While, the advantages of using a computer cannot be refuted, a computer by itself cannot be seen as a way of empowerment. In a classroom setting, a child learns to communicate and assimilate knowledge through various senses and actions. A computer gives one more dimension to such a classroom.

In most classrooms, the skills to use a computer are seen as distinct from learning aspects related to other subjects. (There are rigid, instructional courses on 'typing', 'how to use MS Word' etc. Upon completion of these basic level courses, assignments from the math class or social science class are usually given to children to be typed on the computer.) The problem with such an approach is that we might lead the children to use the computer only in ways we prescribe. Sometimes when teaching about the computer in a de-contextualized way it becomes more complicated than it really is. The goal should be to support the children to use the computer as a seamless resource just like writing or drawing about a topic on paper, making a play in a given space with a number of characters or re-telling or interpreting a story from a book etc.

In Sita School we have explored a few ways in which the use of a computer could be purposeful and set in a real life context.

Introduction

The computer industry is very dynamic with inventions and developments making current technology redundant even within a period of months! Given this situation, it would be only of pure academic interest to explore in detail about the history of early computers, the inventors etc. A practical approach would be to focus on what a computer is, what is it constituted of, where and how is it used and what potentially it could be used for.

Activities to understand and identify parts of the computer

An activity we did was to let the children switch off just one component (e.g. the monitor, the CPU, the speaker etc.) at a time and see how the other components interact with each other through this exercise. The children quickly figured out by themselves what were the Input/output devices and that the CPU is the most important part of what we call the computer.

Scope for further exploration

We could have also taken it further to see how the work of a particular component can be substituted - e.g. what happens if there is no mouse?

How does a component work?

We then built on the understanding of components to see if the children can explore the internals of the parts (Caution: Make sure that you know how to put it back if you are going to take it apart!). This should be a more hands-on activity rather than depicting it on a board or through pictures. We took apart the parts of a mouse to see the internals and understand how it works. It also gave us some insight into how a mouse is susceptible to wear and tear. We also studied an old mechanical mouse and compared it to the newer optic mouse.

Following a series of instructions

In its essence a computer follows a series of instructions given by the user. We reinforced this view of the computer through games for the children –

- A blindfolded child had to follow the instructions of a partner to reach a target.
- Kids search for a hidden treasure and then depict the map as a series of instructions to get to the treasure.
- We gave a task that children do on a regular basis and they made it as a series of instructions. E.g. making tea, taking the bus to Bangalore. We then brought it close to real life situations by introducing the idea of ‘choice’ and ‘possibilities’ – which in turn led us into the concept of ‘branching’. E.g. choosing between two routes on a bus journey. We also explored ways of depicting the instructions graphically and thus introduced flow charts in a real context. We designed a few games around these activities – E.g. filling in the missing step, ‘what can go wrong in our plan of instructions?’, etc.
- We extended the activity to computers and gave an objective to be achieved. We then asked the kids to break it down into a set of actions or instructions. E.g. copying a file from a source to a destination.

Scope for further exploration: We could discuss this further to see how the computer understands these instructions.

Observations and discussions

An exercise we did was based on children’s earlier observations to brainstorm on various places where a computer is used. It was also an interesting exercise to ask children to group these functions in various categories such as an office, a shop, a hospital, a home etc. We then discussed the similarities and differences between their uses in a variety of places.

Scope for further exploration

A similar exercise can be done to explore the different types of computers. In order to arouse the curiosity of children and to make the class more interesting, pictures of various computers (really old ones, the latest and smallest device etc.) can be shown and discussions on these could follow.

Challenges we faced

It was actually difficult to explain the working of components in a simple manner. It was a delicate balance of not confusing the child with in-depth information and avoiding simplistic analogies that could mislead the children. We had to keep refining what content was appropriate.

Learning basic operations on a computer through interesting activities

The mouse and keyboard are important input devices. The children need to get used to these devices from the beginning.

Games for repetition and reiteration

To go through routine and mundane exercises can be boring. The alternative would be to approach it with the idea of games. (E.g. getting used to the alphabets in a 'qwerty' keyboard). There are a number of interactive 'Typing' coaching software materials along with games available on the Internet. It is important to explore and figure out games and activities suited to the child's or school's needs. Most software is freely available. It is preferable to discourage games that are violent or too competitive in nature. For the very young kids, the introduction of numbers and alphabets can also go hand-in-hand with the basic mouse/keyboard skills. There are games that children find very interesting that reinforces concepts in counting, basic math, alphabets, vocabulary, but through stories.

Art on the computer

Another interesting activity to enhance mouse control skills would be to try and replicate pictures on the computer using software like MS-Paint. This can slowly form the basis for doing one's own artwork and using image processing software.

Challenges we faced

Finding the right games was a difficult task. Just using the 'arrow' keys alone will not enable children to improve their skills with the devices. We had to balance some fun with learning also. So, we did end up playing games that children liked which had fewer opportunities for learning skills or concepts. However, this can also be a way arousing interest and enthusiasm in children to use the computer with ease and comfort.

Learning to use the computer in a real life context

Copying sentences or passages to practice typing from a 'typing' manual might not hold the child's interest in doing exercises. Using a prescribed set of instructions to create a pie-chart or a presentation can also get mundane. It might even be harmful if the activity is construed as boring and cumbersome! Instead, if we make it a part of a larger interesting project/exercise that

interests the child, the child will be more engaged in the task. The key is to make the project or exercise purposeful and in a real life context. For example, one of the kids typed a description of a couple of festivals in their village - <http://tinyurl.com/festivals-in-silvepura>

Creative writing and art

We came up with numerous ideas to encourage children to write creatively and then type the same to be displayed. When typing their own work, they are often excited about finishing up an entire exercise on their own.

- Children were asked to explore the surroundings to capture four different images. Then, using these images the children had to create a story of their own. They first wrote the story on paper with their own illustrations. This was later typed and drawn in the computer.



- Children typed poems, riddles and songs written by them. At a later point, some of them created their own music and recorded songs.

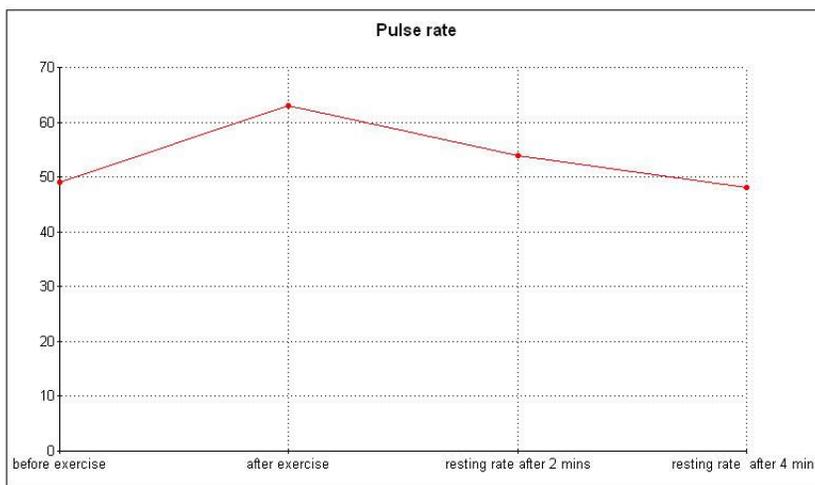
Scope for further exploration

- Different languages could be used to do the same (typed in Kannada first and then in English).
- Image processing software and a scanner can be used to merge real images with the child's imagination. Again, the opportunities to build and add on to these examples in similar lines are endless.

Statistics and presentation

Various exercises involving collection of data can be integrated with computer skills training. The children used spreadsheet software like MS-Excel in the following ways:

- To do a survey amongst children and staff of school to get objective answers and to interpret data - e.g. to vote on the color of a uniform.
Here is what the children did - <http://tinyurl.com/sita-school-uniform-survey>
- To measure weight and height of everyone in the school and then plot charts - as part of the health initiative in the school
- To do graphs and statistical representation related to experiments in science, information from math classes, and research from social science classes etc.



Scope for further exploration

- To track weather patterns in the area - collect rainfall data, high/low temperatures etc. on a daily basis and make curves and charts.
- To track the school budget or project expenses and interpret the data.
- To track attendance patterns over the years in the school.
- To make presentations or slide show of photos on various topics - e.g. history of the village, the child's family etc.

Interfacing with other devices - camera, microphone, speakers etc.

The children can get comfortable with modern digital devices the more they use them and also learn to interface them with the computer. As part of a larger project, they can learn how these peripheral devices communicate and exchange information with the computer.

It is very important that children understand the importance of taking adequate care and precaution when using these costly devices.

A digital camera was used to create activities and projects for groups of children –such as:

- Pictures of various kinds of birds in the campus
 - Creating a virtual herbarium of plants and trees in the school campus
 - Describing a photo and one's thoughts about it - <http://tinyurl.com/sita-school-photos>
 - Photos of their favorite places in school and a description of it
Here is what some children did - <http://tinyurl.com/sita-school-places-in-school>
- Scope for further exploration:
- We could make a collection of images of various types of insects in the campus

A webcam/microphone was used for:

- Making an audio recording of music performances of the children. Trying to mix these sounds with other music to give an original production.
- Recording a play by the children and screening it for the school.
- A fake news channel (to sensitize children on the possibility that not everything seen on TV needs to be believed) and false but humorous advertising.
- A news channel for the school

Scope for further exploration

- Doing interviews with the children and staff of the school to finally make a movie about the school.
- Creating their own games where other children have to guess what a particular sound or close-up video depicts.
- Recording video of a natural phenomenon - e.g. a sunbird sucking nectar or a bee on a flower - then play it in super slow motion to see what happens.

Challenges we faced

Since the children were not well equipped with computer skills, it took a long while for them to complete a task. At times they lost patience and requested us to complete the task for them so as to see the end product! We tried breaking down the project in such a way that they could see tangible results as they went along. E.g. we recorded parts of the video for the news channel and then finally put them all together with music etc. This approach kept the excitement up and also kids were willing to spend more time constructively.

Using external software resources

Children like moving images with rich sounds and music. Learning material that is interactive, with an interesting storyline, characterization and vivid animation can capture the child's interest and attention for long periods. We can even give independent work for the children with minimal adult intervention when we have quality e-learning material that is –

- a. Highly interactive – It should not be a movie screening and should engage the child to think and respond.
- b. Exploratory – It should arouse curiosity and create an urge to know more.

- c. Fun – It should have a healthy dose of games and activities that are fun for the kids to do.
- d. Dynamic in content – The automated software can be flexible enough to adapt to children’s competency levels based on their responses.

We have tried a few CDs from the Azim Premji Foundation (APF). Some of them are very good in content when used judiciously and appropriately. As a teacher, it is important to see it as an add-on resource for your classroom rather than a distraction to keep the kids occupied. The material should be reviewed and used by the teachers to determine its appropriateness for each child’s learning level, contextual understanding etc. The CDs from APF also had options to be used in various languages (Kannada, Hindi and English). It can also be effectively integrated with a lot of the activities detailed above. Similarly virtual encyclopedias, the National Geographic series of DVDs, interactive e-books and various kinds of e-learning material are available for use. Cost and access can be a problem - but, we need not always depend on such material for the curriculum. Such materials can be seen as an additional way to bring variety into the classroom.



Challenges we faced

The children often skipped various screens in the interactive content to head straight to the games. Once in the game section they started randomly guessing answers. If only they had spent time in the interactive session, they could have applied the understanding to do better in the games. Selecting material that moved on with an interesting ‘story’ rather than just a broadcast of information helped a lot as the kids did not want to skip the content.

Using computers as a holistic resource

As the children get comfortable with the basic skills of typing, handling the mouse, keyboard, microphone, camera and other peripheral devices, we can slowly introduce more involved and intricate projects.

Scratch

'Scratch' is a fun, animation based software created by students of MIT (it's an open source software available on the Internet - scratch.mit.edu) as an introduction to programming. The language interface comes in English, Kannada, and Marathi. (There is an active online community helping with an ongoing effort to get it in many more Indian languages.) As the children get used to the interface, they can slowly progress from small activities like making a simple animation to doing a story, creating an interactive game, making a slide show with animation, importing videos, recording voice-overs etc. It involves concepts from mathematics, logical reasoning and can be helpful in reiterating many more classroom concepts.

Some of the animation stories we made in school -

The Foolish Crocodile: <http://scratch.mit.edu/projects/scpadman/1107501>

The Hungry wolf: <http://scratch.mit.edu/projects/scpadman/1107508>



Other continuous or long term projects

The children used the computer to do a news channel of their own. They are also doing a video documentation of their favorite places in school and in the village.

Scope for further exploration

The children can also use the computer to make their own digital school magazine or newspaper. Children can create their own audio studio to record songs, compose music etc. or make their own short movies. Eventually the children could be encouraged to set up their own DTP center for the local area.

Internet

All the activities and projects mentioned above are without the use of Internet. The children should get comfortable with the basic computer skills, with the teacher and should perceive the computer as a tool to achieve various objectives before embarking on a journey through the Internet.

It is important for the children to understand the 'dos' and 'don'ts' of using Internet and an orientation and basic set of ground rules should be put in place. Parental blocks on websites based on the age of the child might be appropriate. Adult supervision might be necessary in the beginning and focus should be on using the Internet as an endless library of resources for the children to complete their objectives or goals. For example, when looking to understand more about space exploration they could use 'Google' or 'You Tube' to get interesting material to add on to their presentation.

We did a video conferencing through Skype (and other free video conferencing facilities) with a school based in England. It was a wonderful experience for the teachers and children as they exchanged questions on culture, lifestyle, climate, food etc. We later had a discussion on England and also on how communication happens. What is the internet? How is it possible to interact with people across the seas?

A report as typed by one of the children:

1. What did you teach them?

I told them about our school. Our school is like a house. Nearby there are many trees. There are Mango trees, Guava trees, Custard Apple trees and Sapota trees. There are many flower bushes. A pond is also there. A lot of space is there in the middle. We have a library. There are Kannada, Hindi and English books. We also have three computers there. We sit on mats and work on the desk.

*Four pupils are in my class. In the school there are thirty five children. There are thirteen small children. There are six teachers who come every day. Santhosh Anna and P***** Akka come to school once a week. A***** Akka comes and teaches dance once in a while. I like school because we have good teachers.*

We clean the school. We do gardening in the mornings. We get ready for prayer and sweep floors. We also fill the drinking water drum.

In the end I showed some fruits and flowers that grow in our school.

2. What did you learn from them?

In England they wear thick clothes because it's cold. Their school uniform is orange in colour. They learn English, French and Japanese. In school their group grows Beans, Carrot, Beetroot and Potato. In houses they wear jumpers, shirts, raincoats, pants and skirts. Their houses are made of cement and bricks. Their houses are big. They have a garden. They have their own bed rooms. They like to eat Pizza and Pasta.

Challenges we faced

The children need to develop enough confidence in themselves and using the computers before they can think of creative projects and tasks on their own. Long term projects are most effective when the children come up with the idea on their own. But, it will take time and as we keep demonstrating that there is no limit to using any resource (not just a computer) creatively, children will also be able to apply their thinking and problem solving skills in a better way.

Finally, no specific examination or evaluations need to be done to understand if the child has progressed in learning computer skills. An alert and observant teacher would understand from the work of the children itself which areas need more attention. Potentially there could be a great flexibility in giving various activities based on the learning levels of children. A good student to teacher ratio would ensure that continuous assessment happens in the classroom. It's always a good idea to share the work of a group or child with the rest of the class or school. This will assure a sense of appreciation for the child's efforts in itself. We observed that the children were proud to present and talk about their work. This also gave them confidence and enthusiasm to do more.

About the Author: Santhosh Padmanabhan (santhosh.padmanabhan@gmail.com) qualified to be a computer engineer. After five years as a CAD engineer in the computer industry, he started pursuing his interests in running and education. He started 'Runners High', a training organization for running and a group that reaches out to schools and colleges to imbibe running, games and physical activity as an integral part of education. He is based in Bangalore and spends his week at Sita School, Ananya Trust and Spastics Society. At Sita School, he has been a part of the physical activity initiatives especially related to running and games. He also spends time with the children in helping them learn computer skills. He is thankful to the schools for providing him the space and opportunity to learn and grow.

www.runnershigh.in

About Sita School: Sita School (jane_sahi@hotmail.com) is a small school located in the north of Bangalore that uses alternative educational methods to encourage children to learn at their own pace without pressure of exams or fear of failure and disapproval. The school tries to create an environment which stimulates the child not just intellectually, but also emotionally, creatively and socially. They try to cultivate a sense of wonder, an appreciation of the beautiful and the healthy. At the same time, they actively cultivate cooperation, sharing and respect for the other and towards nature and material things, to foster a just and balanced way of life.

<http://www.ashanet.org/projects/project-view.php?p=926>