TLC ACTIVITY

SHADOW BUT COLORFUL?

Our experiences are about black colored shadow.....
This Sunday saw a flurry of fervor on “Shadow but colorful?” theme. A group of 9 teachers and 2 APF members set together to discuss, share and perform activity related to shadow specially colorful shadow. Visualizing the importance and relevance of TLC activities for improving classroom practices in innovating and effective manner, Naugaon block team have planned and organized TLC activity on August 28, 2016.

The discussion moves over a variety of topics from associate introduction of last two TLC activities in which we screened “Nil batta Samnata” movie and discussed on “struggle of freedom and today’s Bharat” on the eve of independence day to the conception of what is shadow, how shadow formed, factors and requirement for shadow formation, perception and reality, colorful shadow, daily life and traditional applications of shadow, relevance to classroom practices and importance of updation in teachers professional development.

Prior the activity the facilitator deliberately arranged the required materials (cellophanes of red, blue, green and yellow color, torch, white A4 paper sheet, wooden block), went through relevant reading resources and developed PPT for concluding the session effectively.

For context setting facilitator screened a short slideshows having different shadow of objects as tree, boy, girl, birds, animals, toys etc. (most objects have black colored shadow and last one have colored shadow). Then the facilitator asked to the participants that whenever shadow word pronounced, what are those things which comes in your mind? For thinking a minute participants shared their views some of them were:

Vijay Sharma: Image, black color, shape and size.

Rukum Singh: Tree shadow, black color, darkness, shadow of transparent and opaque objects, based on experiences.

Ujjawla Bhandari: Apple, tree, home, human have different shadow in the presence of sun light.

Subhash Chandra: छाया and परछाया, black color, might be colorful in special and rare cases.

Hardev Bhandari: Locally the dark spots of faces are also called shadow.

Alka Agrawal: I saw and observed colorful shadow during lighting show in various celebrations.

Ramesh Judiyaal: Dark area behinds the object is known as shadow.

By appreciating the responses of the participants I move forward the discussion by putting this thought that we called shadow is of black colored since we see black colored shadow and our experiences are based on black shadow. Several time by seeing or knowing or unknowing we build our perception. Then the facilitator flashed two pictures and asked participants what do you thing about these two’s.
Participants responded that first one picture is black and white and the person in pic looks like robber, larrikin while second picture is colored and the person in pic looks young, smart, gentleman and seems he belongs to a well educated family. After getting the views of the participants the facilitator disclosed their identity (first one is Baba Nagarjun a Hindi and Maithili poet who have written many books, articles, novels and travelogues & received few awards. While second one is Charles Sobhraj, a serial killer who have been arrested in India, Nepal and other countries). Then the facilitator emphasized that by seeing, knowingly or unknowingly we build our perception which shrouded in our minds with complexity whom becomes difficult to break or change. Similarly during classroom teaching-learning processes we should dispose to categories children in categories this/that can't learn or invent something and should think and should be optimist that every child is unique and every have capability to learn and invent.

Then the facilitator asked participants about colorful shadow? Some of the responses of the participants were:

Rukum Singh: We observed black colored shadow but in future anything can happens.

Subhash Chandra: If we will change the light source it means from white light to colored light then something can happens.

Hardev Bhandari: Let’s do and then can say.

Alka Agrawal: By using colored light sources we can get colorful shadow.

Dhyan Singh: There is some role of light source.

Bharat Singh: Can’t say anything.

Vijay Sharma: We can’t say anything will do/perform experiment then can say anything because science demands experimentation.

By appreciating the responses of the participants the facilitator divided participants in 3 groups and
gave instructions for the activity by ensuring each group have all required materials (wooden block as an object, 2 torch light as light source, cellophanes of different colors (red, blue, green and yellow), screen (white paper), 2 rubber bands and ask for observing for all the cases.

**Activity:** Took objects in a position that light project on it and then arrange the screen behind the object such that the shadow formed on same. Firstly took single light source and then twice &trice etc. as per the mentioned cases and also observed the phenomenon by changing the distance between the light source and screen.

**Case 1st:** Single white light source

**Case 2nd:** Single colored light source

**Case 3rd:** One colored + one white light source

**Case 4th:** Two white light sources

**Case 5th:** Two colored light sources

Before performing the activity the facilitator ask participants opinion about five cases, some of them were:

◊ shadow will black and number of shadow will 1 (Case 1st)

◊ will black, light black, may be colorful, confused, can’t say anything let's do an number of shadow will 1 (Case 2nd)

◊ will dark, mix color and number will 2 (Case 3rd)

◊ shadow will black, may be dark, may be white and number will 2 (case 4th)

◊ Shadow will colorful, may be dark, may be black (case 5th)

*(without performing, we can’t sat anything because if we say it will happens like Baba Nagarjun and Charles Sobhraj picture. So let’s perform – Subhash sir and Vijay ma’am)*

Participant performed the activity in groups and noted down the observations. It seems good participants not only develop shadow of given wooden block but also tried to explore shadow formation for transparent objects (water bottle and glass cup). The excitement for colorful shadow was clearly visible among the participants. When they developed colorful shadow, they become thrill and gratified. This seems Eureka moments for them. The observations of the participants were:

<table>
<thead>
<tr>
<th>Cases</th>
<th>Light Sources</th>
<th>Color of shadow</th>
<th>No. of Shadow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Single white light source</td>
<td>Black</td>
<td>1</td>
</tr>
<tr>
<td>2nd</td>
<td>Single colored light source</td>
<td>Black</td>
<td>1</td>
</tr>
<tr>
<td>3rd</td>
<td>One colored + one white light</td>
<td>Dark Purple</td>
<td>2</td>
</tr>
<tr>
<td>4th</td>
<td>Two white light sources</td>
<td>Dark Black, Black</td>
<td>2</td>
</tr>
<tr>
<td>5th</td>
<td>Two colored light sources</td>
<td>Purple + Green, Green + Pink, Yellow + Blue</td>
<td>2</td>
</tr>
</tbody>
</table>
Participants also shared light source, object and screen required for shadow formation and for colorful shadow two light sources (one is colorful) are essential. When we change the distance between light source and object shadow become small and big. In villages elderly people see shadow’s in mountain and predict about time, this is the traditional application of shadow. By appreciating the responses of the participants facilitator discussed on above observations and ask participants what is the reason behind colorful shadow or which phenomenon happens during colorful shadow formation? After thinking for a minute participants responded that “mixing of color, reflection of light.” Then the facilitator explained that we can understand it like the mixing the color which kids mix during painting. Here two colors of light mix therefore we get colorful shadow. Scientifically we used overlap or superimposed word i.e. two colors overlap/superimposed therefore we got colorful shadow. Then the facilitator concluded all the session through a PPT which have following points.

◊ any light source, object and screen are necessary for shadow formation. Without these shadow is impossible.
◊ shadow of different objects will be different it means shape and size will also differ.
◊ shape and size of shadow is not fixed, by varying the distance between object and light source the shape and size varies. As in afternoon our shadow is small but in morning it is large.
◊ the darkness or diminished light caused by the blocking of a light is called shadow.
◊ generally the color of shadow is black.
◊ the color of shadow will black whenever we use one light source no matter it is white light source or colorful.
◊ the number of shadow is equal to the number of light source.
◊ by replacing white light source to colorful light source we got colorful shadow.
◊ information of time through sun dial clock (Jantar Mantar), information of direction, BPT theorem, eclipse, monster in animated movies are the few application of shadows.

Then the facilitator described all picture of the session by drawing the following flow chart.

![Flow Chart](image)

Here the session ended with a task to explore “what will happens when we will replace the screen from white to colorful?” and by the sharing of upcoming “Seminar” which will be on Sep 4, 2016 in the eve of “Teachers Day”.

All the participants hearty gave thanks for organizing this conceptual changing discourse and shows their interest for organizing similar activities in up-coming days.
Reactions in WhatsApp & Facebook page

Aaj ka session bahoot hi saarthak raha. Ummed hai sabhi logo ko iska labh milega or sambandhit school bhi labhanvit honge aisi apeksha karta hun...keep it up

- Subhash Sir

So inspiring. A nation or society where children have enough space to express themselves in diverse ways, that’s sigh of health, democratic, peaceful and progressive society. Let’s give such opportunity to all to TLC Barkot and its team...

- S P Semwal Ji

It was very useful and interesting session. We enjoyed a lot and gained useful practical knowledge..

- Vijay Sharma Ma’am
Teachers of Naugaon block engaged in academic discourse