Science Animation and Students' Attitudes

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INTRODUCTION

Teaching is a kind of social engineering that does not deal with lifeless machines and hard wares; it cultivates tender minds into brave hearts that in turn with brimming confidence is going to build the society. In this endeavour every student is important, every detail present in each topic is essential and every batch of students is precious. The digital transformations that are taking place in educational arena had opened newer avenues for the teachers, learners, administrators and researchers in the form of animation. Animation in its own virtue along with enthusiasm of digital native learners had grown leaps and bounds. The need for animation in third world countries seems to be pinning as teacher- pupil ratio is alarmingly high when comparing with many of the Western counterparts and majority of the education machinery is examination ridden. When the teacher has to run behind the content and ensure zero failure it becomes imperative to teach science with animation. And the metamorphosis that animation could take as per the projection of experts is very promising. This study makes an experimental approach with science animation in secondary school classes and its impact through achievement and attitude.

Meaning of Animation

Etymologically animation has got Latin origin animatio from animare which means the condition of being alive or giving life. Rapid display of images, pictures or frames is called as animation.

The technique of capturing successive frames of pictures or positions of toys or models that create an illusion of movement while the movie is shown as a sequence gives life to animation. In other words a collection of static images joined together and shown consecutively so that they appear to move is called as animation.

Evolution of Animation

Animation's origin can be tracked right from 1824 with the wide usage of thaumatrope that was largely given credit to John Aryton of Paris. Since then the field of animation had experienced various meaningful adaptations and thereby can be classified into three wide verticals namely (i) Traditional animation, (ii) Stop frame animation and (iii) computer animation (2D and 3D). Traditional animation includes Thaumatrope, Phenakistocope, Zoetrope, Flip book, and Praxinoscope.

Thaumatrope

In early 19th century, Thaumatrope was very popular. Etymologically Thaumatrope has got Greek origin Thauma meaning marvel and tropos meaning turning. Two pieces of string with two different pictures on each side, like as a tiger and a cage, is attached to a small disk. Twirling of strings quickly between the fingers seems to combine into a single image. This is due to persistence of vision, the physiological phenomenon that ensures imagery rests in the eyes and brain for a small fraction of a second even after the vision is blocked or the object is removed.

Figure 1.
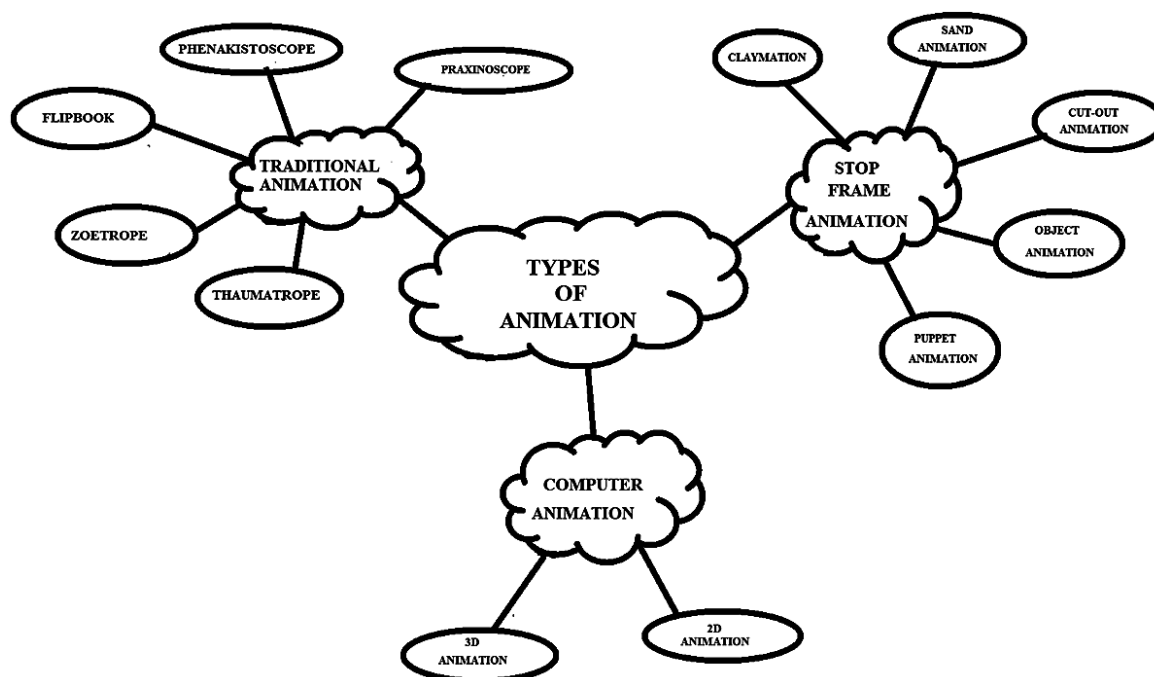
Phenakistoscope

Phenakistoscope was the earliest animating device invented simultaneously by Joseph Plateau of Belgium and Simon Von Stampfer of Austria in the year 1831.In Greek Phenakezein means to deceive or to cheat. It composed of a disk with series of images pasted or drawn on radii of the disk at different distance from the centre. The Phenakistoscope would be placed in front of a mirror and rotated. While the phenakistoscope rotates, a viewer can look through the slits at the reflection of the drawings that are visible like a flash when a slot passes by the viewer's eye and ensures the illusion of animation.

Zoetrope

William George Horner in 1834 suggested the concept of Zoetrope. Etymologically Zoetrope has got Greek origin Zeo meaning life and tropos meaning turning. Zoetrope literally means "wheel of life". The principle is same that of phenakisto-scope. It is a cylindrical rotating instrument with many frames of images printed on a paper strip kept over the inner circumference. The observer watches through vertical slits around the sides and view the moving images on the opposite side as the cylinder rotates. As it rotates the frames between the viewing slits moves in the opposite direction of the picture on the other side and serves as a micro shutter. It does not require the use of a mirror to view the illusion, and as it has cylindrical shape it can be viewed by many at a time.

Flip Book

John Barnes Linnet, introduced the first flip book in 1868 and named it as Kineograph (moving picture). It was a book which had a series of images, when flipped shows that the drawings are moving. It is the simplest way of making animation without a camera.

Praxinoscope

In Greek praxein means action and scope means watcher. Praxinoscope had got two variants namely

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