PARTICIPATORY VIDEO FOR DEVELOPING SPIRIT OF INNOVATION IN SOCIO-ECONOMICALLY UNDERPRIVILEGED HIGH SCHOOL STUDENTS

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Many centuries ago Aristotle had observed, 'What we have to learn, we learn by doing'.
However, quite contrary to this observation, in typical Indian Education system, which is mainly examination-centric, learning science in school is by rote, which is the most unscientific way of learning science !
Learning by rote may fetch marks but can neither create scientific temper nor can develop scientific mindset.
Breaking away from the conventional path of producing video films for children with professional support, the author has tried to tap the spirit of innovation and creativity in children themselves to produce video clips that have a direct relevance to their studies.
The present paper discusses, the objectives, methodology, observations and inferences that could be drawn from personal observations and the products, viz., video clips created by the students which throw light on how video with participatory approach can bring about qualitative change in participating student's personality as a 'student of science'.

Introduction

While conducting her research for Ph.D., this author came across very disturbing facts regarding the science education of students coming from socio-economically underprivileged community. Some of these facts are as follows :

- As these students speak rustic form of dialect, they find it difficult to understand scientific language in their science textbooks. Hence, understanding of basic concepts was found to be poor.
- They don't find content in the science book interesting, relevant and useful in their day-to-day life which make them absolutely passive learners in the class.
- Concepts not understood in each standard, go on accumulating to such an extent that, by the time students reach high school, they are unable to understand even 10 per cent of the new concepts taught in the school.
- Questions asked in routine school examinations, judge only memory-based knowledge which encourages mugging.
- Science practicals too, are carried out in most unscientific way in which students don't explore, instead they just go to laboratory and perform as per instructions given by their teachers. This can not create spirit of enquiry in students.
- They cannot relate to science programmes shown on channels like Discovery or science

clips shown on news channels mainly due to language barrier.

What they Need are Some Tools

- The tools will give them experience of learning and will make them active partners in education processes.
- Will create suitable environment for their thinking and reasoning faculty to develop.
- They can relate easily.
- They can easily use. There should not be any language or any other barrier.
- Will provide them stimulation required to stay at school and help them to understand the subject and teach them to apply that acquired knowledge.
- Will help to shape up their personality as a science student who possesses spirit of enquiry.

Camera in the hands of a learner

Thought behind the Experiment

Developing video requires creative and communication skills. Creativity involves originality, which generates invention. Hence, actually getting learners, coming from underprivileged community to create video, would be more effective than use of educational videos produced by professional. This was the thought behind the experiment.

Experiment Done by the Author

The author carried out the experiment in Swami Vivekanand High School, village Asade in Mulashi Tehsil in Pune district of Maharashtra. She, herself a media professional, trained 64 students studying in Classes VIII and IX, all from socio-economically underprivileged community in videography. Two days Workshop was conducted for them and with low-cost video equipment, they were introduced to basic knowledge of skills like video camera operations, editing, direction and script writing using different formats like documentary, drama, etc.

Then they were divided into five sub-groups comprising of approxmately 12-13 students in one

sub-group showing interest and skills in different video production activities. Each group chose topics from their science textbooks, developed scripts under the guidance of the author and their science teachers and produced video films on a selected concept.

Shooting was done with two cameras. One was handled by an expert cameraman and another was handled by students. Thus, five films on concepts in science textbooks for Classes VIII and IX were produced by these students under the guidance of the author and teachers.

At the time of editing, though students did not operate the machine, they drafted the editing script and were sitting next to the professional editor for getting the editing of the films done. Thus, content selection, script development, preparing required material for the film, recording, editing, everything was done by students very enthusiastically.

All the 64 students viewed their own film as well as films produced by other groups and tried to evaluate their own work.

Some Observations

(1) Students were quite receptive to video technology. Glamour associated with video medium provided required stimulus for study.

(2) While developing a film, students discussed the subject, communicated with teachers and themselves removed obstructions in learning process, which made learning process very interesting for them.

(3) Students felt the need to visit school library while in search of visuals for the film.

(4) Even those students who didn't possess good reading and writing skills could participate in video production wholeheartedly and could acquire knowledge overcoming literacy handicap.

(5) While developing a script on 'Chemical Bonds' students did lots of brainstorming which made them understand their problem in studying Chemistry that , 'there are too many names of elements, compounds, etc., in Chemistry. Too much of informations lead to confusion.'

Understanding a problem was the first step towards solving it.

Students dramatised the theory, personified the elements and compounds, called each other by the names : Mr Chlorine, Mr Oxygen, Miss Hydrogen, etc., and wore the name-plates. Thus, while rehearsing and shooting this film, theory was automatically learnt by heart.

(6) While developing a script on the topic 'Force and Pressure', brainstorming made students understand that, 'Physics is not an information-based science'. Instead, concepts and logic behind them are of prime importance. If those concepts are not clear then mugging of theory is also not possible.

Hence, they chose drama-in-classroom format in which a teacher (role played by a student) performed 'Practicals' and students 'Asked' questions. Reflection of student's educational communication needs was found in the reason behind choosing

Cooperative working attitude displayed by students while working. Discussion, brainstorming never happen in routine school activities

this format. According to them this was the teaching coupled with practical and was the 'ideal way' of learning Physics—which does not happen in their routine class.

(7) In another film on 'Acid-Base-Salt' (Chemistry), neutralisation reaction in which 'acid and base chemically react with each other to form salt and water ' was picturised as , 'fighting between acid and base leading to disappearance of two and water and salt appeared on the screen' which gave naughty playful touch appropriate to their age, to the whole theory. This can be termed as the best example of *Science through child's eye* .

(8) In a seven minutes film on the concept, 'Balanced and unbalanced force', blend of two formats —documentary and drama— was used for presentation. Initially an anchor (role played by a student) shows many acts like shifting a book, opening a box, throwing a ball, etc., to create curiosity in the minds of viewers.

Then she asks the audience, 'Have you recognised me? I am force!' Same way, balanced and unbalanced forces (roles played by two IX Class girls) introduce themselves to the audience by means of a very simple yet apt examples of game *Rassikhech* played by children.

Two groups of girls try to pull the rope standing face-to-face in opposite directions to each other. When rope remains at the centre, i.e., there is no displacement of rope in either of the sides then it shows that girls from both the sides have applied the same force.

Inversely, when either of the groups applies more force, rope is pulled towards that side showing presence of unbalanced force.

Each and every participant gave equal contribution. They rewrote the script five times and thus showed great perseverance. They rehearsed the complete programme many times and hence could complete the task in lesser time than other groups. Drama rehearsals helped students to learn the theory by heart, which otherwise they do unwillingly by mugging, that too, without understanding the theory. It proved that, students do any activity voluntarily only when they 'feel the need' to do so.

(9) For a seven minutes film on Newton's laws of Class IX, Physics format used was musical drama. Film opens with a group of students singing Newton's 'Powada' (An age old famous Maharastrain folkart). One-by-one two lines of 'Powada' are sung on different concepts like inertia, motion, conservation of momentum, action-reaction, etc. After each song, students present video capsule showing relevant visuals of that concept with suitable examples in drama format. Student realised that Physics is not information-based subject, instead, concepts and logic behind them are of prime importance.

Brainstorming helped students to remove obstructions in their learning process and made them understand the relevance of the science in their day-to-day life.

Evaluation

The processes used in the evaluations are observations, interviews, test, etc. Evaluation of the project was done on the basis of following criteria :

(1) Qualitative changes in student's personality was judged from following factors:

(a) Motivation (urge for self-development, curiosity, exploration, persistence, novelty)

(b) Cognitive (attentiveness, memory retention, imagination)

(c) Acquired skills (communication, science process skills, self-evaluation, critical as well as divergent thinking, problem-solving tactics)

(d) Habits (reading books, watching educational TV programmes, showing interest in practical work)

(e) Abilities (concentration, goal-setting, decision-making)

(f) Rise in self-confidence.

In one production process, we cannot expect total change but there was definitely positive qualitative change observed in students' personalities. Considering the factors mentioned above we found that:

- After viewing the films, all the participating students* tried to evaluate their own work and expressed their feelings that 'Next time we will do better job. We will correct the mistakes which we have committed this time.'
- This type of 'urge for self-development' is never displayed by them in regular school sessions.
- While developing from scripts for the films, students realised that they need to understand certain concepts which they had studied in previous standards and 'had not understood at that time'. So they referred to previous standard books, and tried to understand those concepts, which they never do in their routine school work.
- Students started using school library.
- Their active involvement in day-to-day classroom activity increased. They started

* Most important point to be mentioned here is "Not all students who could think and solve those tricky problems are otherwise good scorers in routine school examination."

demanding more number of practical sessions in their school.

- They searched for good science programmes on television and found that 'there are no good science programmes for high school students'. They expressed their desire to see science-based programmes on TV in their own mother tongue 'Marathi'.

(2) To measure Quantitative changes, after preview session, students were given a test based on concepts taught through films. Test comprised of both objective as well as subjective questions judging understanding and application of the acquired knowledge and science process skills like observing, inferencing, analysing, etc. Instead of asking direct question like, 'Explain Archimede's Law', which judges memory and which is usually asked in any routine school examination, students were asked questions judging 'understanding' and 'application of gained knowledge'. These students had never come across such type of questions which would require them to 'think'. For example :

Q. (A) Students were asked to measure the volume of the paper-weight without using scale. Sixty-six per cent of the students who had produced film on Archemede's Law could solve this question. Thirty-one per cent students who 'watched' this film could solve this question. While, those students who had neither watched nor produced the film could not even 'think' over this problem. Their result was 0 per cent.

Q. (B) If a glass chip is immersed in water, it displaces 140 cc water, then which of the following can be the dimensions of the chip?

a) 10, 7, 2 cm, b) 15, 4, 7 cm, c) 14, 4, 5 cm

Seventy-one per cent students who had produced this film could give correct answer. Thirty-three per cent students who had watched this film could answer correctly. But again, those students who had neither watched nor produced the film could not even 'think' over this problem. Their result was 0 per cent.

Conclusion

It is as found that in the approach, adverse factors like, communication gap, use of symbols/ examples not familiar to students, volume of content which student cannot grasp at that time were considerably reduced.

Many students who can't score well in science in routine school examination are looked upon as dullards, which is wrong because all the aspects of intelligence are not judged in routine school examination, e.g. science process skills.

This study showed the importance of participatory video activity in science education.

Video production process requires synchronising physical and mental processes, which is vital for learning science. It is possible to sharpen various skills like communication, science process skills, etc., and shape up attitude, e.g. co-operative working attitude, urge for self-development in the process of acquiring proficiency in various tasks in video production.

Students can be in control of their own learning according to their own needs, own speed and

capacity to grasp the concept and apply that acquired knowledge in practice. While looking through camera lens, students can grasp exactly 'What is to be focused and while editing a film they understand' what is to be picked up and highlighted, in effect, they realise— 'what is to be studied'.

Thus, learning happens naturally.

Foundations of participatory video activity are participation rather than passive learning, Suitable visuals rather than verbal explanation and exploration rather than mugging.

Thus, with the help of participatory video, school education should be remoulded to the mode of 'learning by discovery' and 'learning by doing'.

This experiment can be replicated in other schools for underprivileged students in India. Video network can be formed among schools run by Municipal Corporations or *Zilla Parishadas.*